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The relationship of reading methods and learning styles to Taiwanese 12th grade male students' reading comprehension in English

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THE RELATIONSHIP OF READING METHODS AND LEARNING STYLES TO TAIWANESE 12TH GRADE MALE STUDENTS' READING COMPREHENSION IN ENGLISH

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

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CHAPTER I

THE RESEARCH PROBLEM

Statement of the Problem

Reading Aloud (RA) is used more frequently as a technique in both first and foreign language learning classes than silent reading (H. D. Brown, 2007). However, there is no conclusive research on the effectiveness of using RA to improve students' reading comprehension in first language learning classrooms, and only a few studies in second and foreign language learning classrooms. In first language learning settings, research studies (Armbruster & Wilkinson, 1991; Bernhardt, 1983; Davis, 1981; Leinhardt, Zigmond, & Cooley, 1981; S. D. Miller & Smith, 1985; Wilkinson & Anderson, 1995) have indicated that older children and adults, who are average or strong readers, comprehend better after reading silently, but other studies (McCallum, Sharp, Bell, & George, 2004; Prior & Welling, 2001) discovered that comprehension scores did not differ significantly between the two modes.

In second and foreign language learning situations, RA is frequently used by language learners and instructors without questioning its effectiveness as a comprehension tool. Although RA is frequently used, only a few researchers (Menasche, 1977; Saiegh-Haddad, 2003) conducted studies on comparing the use of oral and silent

reading in English as Foreign Language (EFL) classes. However, the focus of these studies was not on reading comprehension but on the efficiency of the length of time using both modes.

Considering language learners have learning style preferences which may affect their reading comprehension when they use different reading methods, this study will also examine students' learning styles as factors. Different kinds of models have been used to determine a learner's preferred learning style (Butler, 1988; Gardner, 1993; Gregorc, 1985; Harb, Durrant, & Terry, 1993; McCarthy, 1990; Sims & Sims, 1995; A. Smith, 1998), and these models are somewhat overlapping with each other. A popular model proposed by A. Smith (1998), which classifies learners as visual and auditory, will be adapted for this study. Studies found that slight preferences toward visual and auditory modes may distinguish one learner from another (H. D. Brown, 2007), and learners' preference may affect their reading comprehension by using reading aloud or silent reading. Considering all these factors and examining them carefully on their influence on reading comprehension is very important. In order to help EFL learners and instructors adopt a more effective method of reading comprehension, further research is necessary on the relationship between reading methods and learning styles to improve EFL learners' reading comprehension.

Purpose of the Study

The purpose of this study was to measure the relationship of reading methods and learning styles of Taiwanese EFL 12th grade male students' reading comprehension in English. The reading methods in this study had two levels: oral reading and silent reading. The learning styles in this study had two levels: visual learner and auditory learner; and each was subdivided as three sub-scales: low, medium, and high. The independent variables included: (1) the participants' learning styles, which were measured by a survey instrument and (2) the reading methods, which the participants used to read two reading passages selected from the Test of English as a Foreign Language (TOEFL). The dependent variable was generally defined as students' reading comprehension, which was measured by their reading comprehension scores (Figure 1). The data collection was conducted in Taiwan from November 11th to 28th, 2008. Participants' first language, English proficiency, education level, gender, and age were controlled in the study.

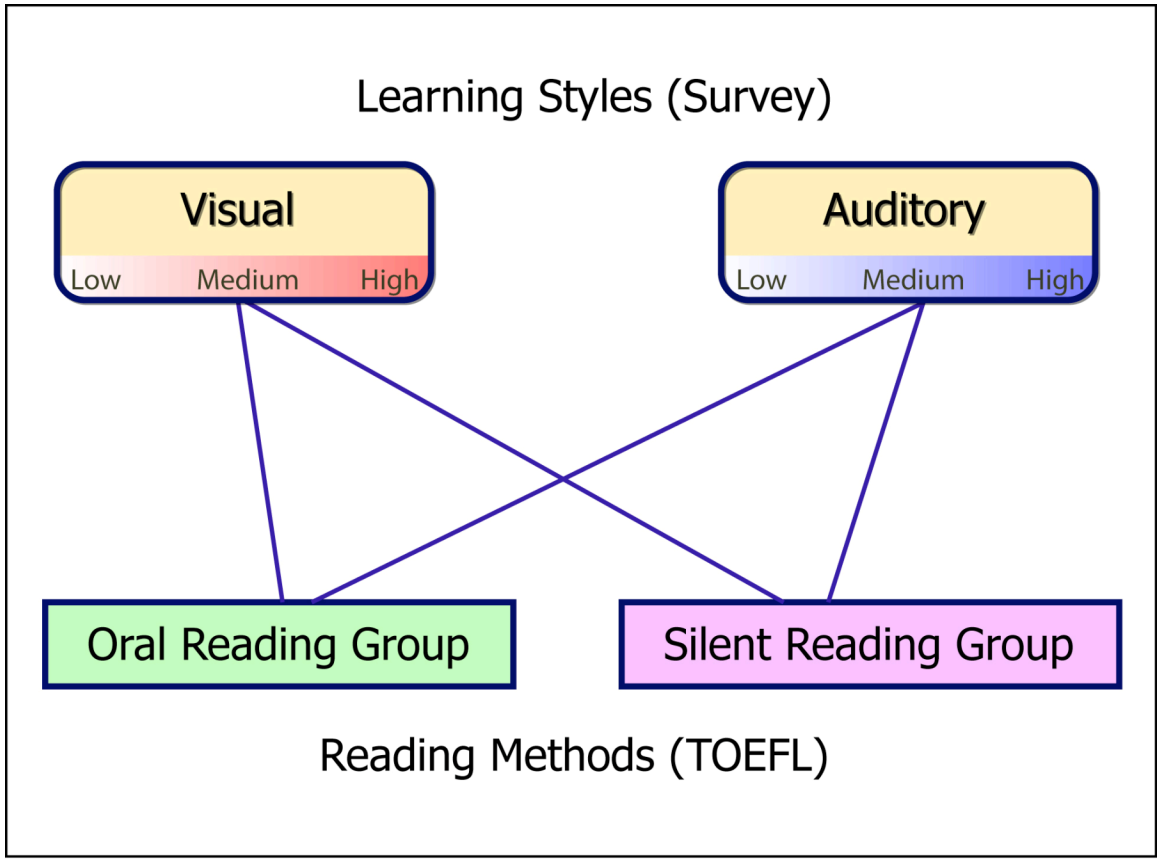

Figure 1. The Research Design Concept

Background and Need for Study

Using Oral and Silent Reading for Self Reading

From early Western records, Reading Aloud (RA) was regarded as the norm, while any silent use of language was considered suspicious by the ancients (Kelly, 1969; Menasche, 1977). In medieval times, monks, who lived in almost completely communal settings, had to be isolated in carrels when reading, which was conducted orally. In Roman times, only one record described silent reading, the tone of which indicated that

silent reading was a remarkable but rarely used skill. From the Renaissance to the nineteenth century, reading continued to be viewed as an oral activity and was usually taken as preliminary to memorization. This attitude reached its zenith during the eighteenth century.

From the nineteenth century on, silent reading became commonplace because the social, cultural, and technological changes of the period greatly impacted what the term "reading" connoted (Pugh, 1975). Most adult reading tasks changed in character as a result of increased literacy, the flourishing of private reading in public places, such as railway carriages and libraries, and the greatly increased volume and variety of reading matter, newspapers, for example. Silent reading then became the norm in the twentieth century, and reading materials were written intentionally for this mode.

Not only in the Western countries, but China and the East, experienced a similar trend from oral to silent reading. Reading in ancient China always meant reading aloud (Liang, 2005). When children learned to read, they were asked to read passages aloud. The essential part of RA was to memorize the reading materials. Ancient Chinese believed that memorization was one of the most important purposes of reading, and comprehension would come naturally after the memorization. Therefore, no matter the age differences, an ancient Chinese reader always read aloud a passage when s/he was

reading alone or with other learners in school. In the school settings in Taiwan and China, even though the notion of reading has changed the focus from memorization to comprehension, young learners are still frequently asked to read materials aloud together and individually.

Taiwan's Languages and Education System

Taiwan, sometimes known as the Republic of China, is the name often used in referring to the main island of the country and its conglomerate of 64 islands. The main part of the country is about 36,000 square kilometers. The last census in November 2008 indicated that Taiwan's population was 23.01 million (Ministry of the Interior, 2009). Although approximately 70% of the population speaks Taiwanese fluently, its writing system, shared with Chinese characters but with different sounds, has not been developed enough to represent all the distinctive sounds of Taiwanese. Mandarin Chinese is the national and official language of Taiwan (Oladejo, 2006).

Education is compulsory for every child: six years in elementary school and three years in junior high school. After graduating from junior high school, students have choices by passing some placement/entrance examinations to attend vocational schools for two or five years or academic based senior high school for three years. English is the only compulsory foreign language and one of the two compulsory languages in public

schools, the other being the national and official language, Mandarin Chinese. Before 2005 school year, compulsory English education started from junior high school. At the beginning of the 2005 school year, grade three elementary school children commenced learning English (Ministry of Education, 2008). In this study, the sample of the participants was senior high school students who received formal EFL education for five years in the public school system.

Conceptual Framework

This quantitative study was based upon several conceptual frameworks; reading comprehension focusing on Schema theory (Piaget & Inhelder, 1969, 1973; Shank & Abelson, 1977), Vygotsky's Egocentric and Communicative Speech Theory (Vygotsky, 1978, 1986), and Learning Style Theory (Gardner, 1993; Slack & Norwich, 2007; A. Smith, 1998).

Schema Theory

Schemata are acquired, extended, and refined as a result of both direct and vicarious experience, and they carry with them scripts, or cognitive maps (Shank & Abelson, 1977), that tell a person what to expect and how to behave in specific situations. Piaget suggested that the mind is organized in complex and integrated ways. The simplest level is the schema, a mental representation of some physical or mental action that can be

performed on an object, event, or phenomenon. Piaget defined a schema as the mental representation of an associated set of perceptions, ideas, and/or actions. Piaget considered schemata to be the basic building blocks of thinking (Piaget & Inhelder, 1969, 1973; Woolfolk, 1987). A schema can be discrete and specific, or sequential and elaborate. In reading, readers literally make meaning from the interaction between prior knowledge and previous experience, the information available in text, the "stance," or position they elect to take in relationship to the text, and immediate, remembered, or shared social interaction and communication (Rosenblatt, 1994). The more prior knowledge and previous experience the reader has, the less chances a mis-match will happen.

Vygotsky's Egocentric and Communicative Speech Theory

Vygotsky (1978) argued that when children first learn to speak, speech occurs entirely in the social realm, mainly between themselves and their parents. As children develop, their speech becomes differentiated into egocentric speech, a speech for self, and communicative speech, a speech for others. Both egocentric and communicative speech have communication purposes. While communicative speech is used for outside communication, egocentric speech is used for self-guidance and self-direction to transfer language from the social world to the private world. Vygotsky (1986) stated that "in the beginning, egocentric speech is identical in structure with social speech, but in the

process of its transformation into inner speech it gradually becomes less complete and coherent as it becomes governed by an almost entirely predicative syntax" (p. 243). In this passage, Vygotsky explained that inner speech focuses on semantics, not phonetics.

Forcing a competent silent reader to read out loud would focus attention on phonetics and words/phrases other than predicates (Vygotsky, 1986). This would likely be distracting and consequently interfere with understanding, thus leading to poorer comprehension scores for oral reading, compared to silent reading. Therefore, according to Vygotsky, children learn silent reading after oral reading. Because of the distraction from oral reading, children would perform better reading silently than orally (Martí, 1996; Prior & Welling, 2001).

Learning Style Theory

Psychological and educational theory has a long tradition of research into learning styles (H. D. Brown, 2007; Slack & Norwich, 2007). Learning style is a dispositional or trait concept in that it is about how someone usually approaches learning—that is, how they learn. Learning style has been associated with allied terms, like cognitive style and learning strategy.

One of the most important theories about learning style is the theory of multiple intelligences, which was developed in 1983 by Dr. Howard Gardner, professor of

education at Harvard University. It suggests that the traditional notion of intelligence, based on I.Q. testing, is far too limited. Instead, Dr. Gardner proposes eight different intelligences to account for a broader range of human potential in children and adults. These intelligences are: linguistic intelligence; logical-mathematical intelligence; spatial intelligence; bodily-kinesthetic intelligence; musical intelligence; interpersonal intelligence; intrapersonal intelligence; naturalist intelligence (Gardner, 1993).

While Gardner's theories were based on socially-recognised talents, Smith (1998) proposed a Accelerated Learning Framework by examining Gardners' the learning intelligences on brain characterized and only focused on three learning styles: visual, auditory and kinesthetic. Smith's work, on "brain-based', accelerated learning in practice, aimed to enhance pupils' motivation and achievement, and appeared to incorporate many ideas derived from research on thinking skills and cognitive styles. Smith's Accelerated Learning Framework is based around the notion that intelligence is modifiable in school, so that pupils can be taught to think and learn more effectively using a range of visual, auditory and kinaesthetic learning styles, such as mindmapping, musical stimulation, physical activity and practical design activities. Students of different learning styles may respond to aural and visual messages differently.

Research Questions

Through this descriptive research study, the following questions measured the relationship of reading methods and learning styles to Taiwanese EFL 12th grade male students' reading comprehension in English.

1. To what extent do reading methods affect Taiwanese 12th grade male students' reading comprehension?

2. To what extent do learning styles relate to Taiwanese 12th grade male students' reading comprehension?

Significance of the Study

As an EFL learner, I started learning English at age 13 in Taiwan. Almost in every English class the teachers would ask my classmates and me to read some passages aloud together or individually. When I studied English Language Teaching in college as well as in graduate school, reading aloud was an important teaching and learning method, stated in the teachers' guidelines, for EFL learners. During my observations of teaching in Taiwan and in the United States, English teachers frequently asked EFL/ESL (English as a Second Language) students to read a passage aloud by saying "If you don't understand a passage, read it aloud," or "Try to read your writing aloud. It will help you write like a native speaker." However, from my own two decades of English learning experiences, I

seldom felt that reading an English passage aloud would improve my reading comprehension. I know I am a person who needs to have visual aids to facilitate my understanding: seeing the words is more important than hearing the sounds. I usually benefit from silent reading more than from reading aloud. Therefore, I wonder if it is because my own leaning style makes this reading aloud method not so useful for my EFL learning, or whether this is a common issue for most EFL learners.

RA is used frequently in language classrooms, either in the first language or in the second/foreign language. RA is even showed in the English teaching guidelines for the English instructor in Taiwan. However, the effectiveness of using RA and silent reading in student reading comprehension is not confirmed yet. Learning style is another important factor on students' reading comprehension. Studies (H. D. Brown, 2007; Sarasin, 1999) have shown that students respond differently in reading based on their learning styles. Therefore, the relationship between reading methods and learning styles is important to be studied, and this study will fill a need in this research.

This research will benefit curriculum planners in organizations, researchers in the EFL field, EFL reading teachers, and EFL learners. EFL educators and learners can base their work on the findings to design more effective teaching and learning plans. This measurement of the relation between reading methods and learning styles will benefit the

understanding of how reading comprehension in the EFL field can be affected.

CHAPTER II

REVIEW OF LITERATURE

Introduction

Reading, one of the four skills in language learning, is broadly studied. Reading comprehension can be viewed as an essential element in most reading activities (Block, Gambrell, & Pressley, 2002). Reading methods, oral and silent reading, are used frequently in first and second/foreign language learning without their facilitation on reading comprehension being questioned (H. D. Brown, 2007). Learning styles also have a great impact on a learner's learning process (Cassidy, 2004). Studies (Butler, 1988; Gardner, 1993; Gregorc, 1985; Harb et al., 1993; McCarthy, 1990; Sims & Sims, 1995; A. Smith, 1998) have shown that visual and auditory learners prefer different learning methods and an appropriate learning method can make a huge difference on a learner's success. However, what are the interactions between oral and silent reading methods, and visual and auditory learning styles? To understand these issues in an EFL setting, this study focuses on two research questions: 1. To what extent do reading methods affect Taiwanese 12th grade male students' reading comprehension? 2. To what extent do learning styles relate to Taiwanese 12th grade male students' reading comprehension?

For this literature review, I first examine the effectiveness of using oral and silent

reading to improve students' reading comprehension within three interdependent domains: oral reading with Vygotsky's perspectives, oral reading with silent reading, and reading fluency and reading comprehension. This segment includes research in the foreign language learning setting. Next I review reading comprehension by focusing on Schema theory as well as three kinds of knowledge suggested by Brown, Campione, and Day (1981): content knowledge, strategic knowledge, and Metacognitive knowledge. The final section of this review examines learning styles. The different kinds of learning styles are discussed and the characteristics of visual and auditory learners are addressed.

Oral and Silent Reading

Examining Oral Reading with Vygotsky's Perspective

Soviet psychologist Lev Vygotsky (1978; 1986) claimed that children's language and thought are originated differently, but they eventually combine as children develop, and language guides and drives thought on. Vygotsky viewed the infant as being social from the very start. To him the crying, the babbling and the first words and sentences were typically attempts to gain attention and to get something done. He argued that at first, speech occurs entirely in the social realm, mainly between children and their parents. As children develop, they differentiate their communication into two kinds speech: communicative speech and egocentric speech. The communicative speech is used to

communicate with other people. Egocentric speech is used for individual and self-regulating to internalize the social experiences into the private world.

Although Vygotsky (1978; 1986) did not explicitly develop a model of the transition from oral to silent reading, his description of speech development can serve as a basis for such a model. “When reading is internalized, it is modified and constructed to serve a self-regulatory and self-guiding purpose. It is not simply a copy of the previously social reading now going on in the reader’s head” (Prior & Welling, 2001, p. 3). Therefore, forcing a competent reader to read aloud instead of silently affects internalization and causes distraction of reading comprehension. The reader may perform better in silent than oral reading (Martí, 1996; Prior & Welling, 2001).

Prior and Welling (2001) studied the oral and silent reading issue through Vygotsky’s concepts of internalization and egocentric speech. Their study tested a hypothesis that beginning and poor readers typically comprehend text better after reading orally rather than silently, whereas more advanced readers tend to show superior understanding after silent reading. The participants were 73 children in grades two, three, and four, reading passages both orally and silently. They then were tested individually with a comprehension examination—Ekwall/Shanker Reading Inventory.

The results showed that all of the predictions were not confirmed. The grade two

students' comprehension scores did not differ significantly between the two modes. In contrast, grades three and four students' comprehension scores were significantly higher after oral reading. In the conclusion, Prior and Welling (2001) stated:

> The findings of the present study indicate that oral reading is superior for comprehension only after a few years of schooling. Initially beginning readers may understand text best when it is read by others. Oral reading then appears to become the better mode for comprehension and may continue as such into the latter half of elementary school. Future research with older participants will further assess this claim. (pp.13-14)

Although this conclusion sounded convincing, it conflicted with their research results. The researchers tried to provide explanations to interpret the results before making their conclusion. They stated that the oldest children in the study only had been attending school for about three and a half years at the time of testing, possibly insufficient time or exposure to learning experiences for internalization to occur. Although the researchers might explain the scores for grade four, they cannot determine that the second graders scored equally in both silent and oral reading and cannot support their conclusion.

The other questions in Prior and Welling's (2001) study is that oral reading may not represent the same concept as Vygotsky's communicative speech, and silent reading may not represent the same as egocentric speech. The participants in this study were using reading to gather information from the passage instead of communicating with others. In Vygotsky's definition of communicative speech, it is essential to have another

person with whom to communicate. Because of the definition differences, Prior and Welling's research results could not either support or controvert Vygotsky's concept that children learn oral reading first.

Comparing Oral Reading with Silent Reading

Both S. D. Miller and Smith (1985) and McCallum, Sharp, Bell, & George (2004) conducted studies examining silent and oral reading of literal and inferential comprehension concepts. A literal question demands recognition of similarities between words in the question and words in the texts whereas an inferential question demands a second-level recognition, one requiring the use of implied meanings (McCallum et al., 2004; J. Miller & Schwanenflugel, 2006; S. D. Miller & Smith, 1985). Although these two studies focused on the same concepts, the results were not identical.

S.D. Miller and Smith (1985) conducted a study on the differences in literal and inferential comprehension after reading orally and silently. Two categories of questions were prepared based on criteria presented by Smith (1979). The participants in this study were 94 second to fifth graders in three language competence groups: Level Low (L), Level Medium (M), and Level High (H). Each child was tested individually for both silent and oral readings; all testing was completed within a 2-week span.

The following results were indicated in S. D. Miller and Smith's (1985) study: 1)

the poor reader comprehends better during oral reading than during silent reading; 2) the poor reader tests better on inferential questions than on literal ones when inferential questions include items measuring mean idea, cause-effect relation, and use of implied meanings; 3) the average reader comprehends better during silent reading than during oral reading, and handles all questions equally well; 4) the good reader is generally strong at both oral reading and silent reading on various measures of comprehension, and exhibits superior acquisition of details; and 5) the best single indicator of competence is literal comprehension, that is, reading for details. S. D. Miller and Smith provided a comprehensive study on comparing students' language level with the effectiveness of using oral and silent reading to improve reading comprehension.

Examining the literal and inferential comprehension by using reading orally and silently, McCallum et al. (2004) conducted a study with 74 elementary and middle school students. Students were randomly assigned to one of two conditions: 39 students read the passages silently and 35 read orally, with time recorded for each passage read, and then answered literal and inferential questions. The comprehension score and the time spent were independently measured. Their results indicated that 1) a comparison of mean reading comprehension scores showed no significant difference between silent readers and oral readers and 2) with reading ability controlled, silent readers took significantly

less time to complete passages compared to those who read orally.

A research concern about McCallum et al.'s (2004) study is the lack of consideration of students' language proficiency. Seventy-four elementary and middle school students participated in the study. The participants were assigned into two groups evenly. The mean scores of both were used to do the comparison. However, the difference of age, language proficiency, or cognitive development within each group could not be interpreted from their results. McCallum et al.'s (2004) research results were not comparable with S. D. Miller and Smith's (1985) findings. S. D. Miller and Smith measured reading comprehension in different language levels, but McCallum et al. (2004) measured it from a broader perspective.

Examining Reading Fluency and Reading Comprehension

The development of fluent reading has far-reaching implications for academic success. In the process of learning to read, children move from relying on slow, algorithmic, letter-by-letter (or unit-by-unit) processing to quickly rendering text (Logan, 1997). There is a recognized correlation between fluent reading and comprehension skill, although the nature of the relation is not clearly understood (J. Miller & Schwanenflugel, 2006).

Gough and Tumner (1986) indicated that reading comprehension could be

described in terms of two factors—language comprehension and word decoding. Word decoding is necessary for comprehension to be enhanced. As decoding moves toward full automaticity, reading comprehension skill should equal comprehension of oral language.

Supporting Gough and Tumner (1986), Kuhn and Stahl (2003) stated that two primary theories related to fluency's contribution to comprehension, each of which emphasized one of fluency's component parts. The first and better known of the two theories stressed the contribution of automaticity to fluent reading, whereas the second focused on the role of prosody.

Based on Schwanenflugel, Hamilton, Kuhn, Wisenbaker, & Stahl's (2004) study of the relation between the reading fluency and prosodic features, J. Miller and Schwanenflugel (2006) conducted a research study to determine (1) the degree to which the prosody of syntactically complex sentences varied as a function of reading speed and accuracy and (2) the role that reading prosody might play in mediating individual differences in comprehension. Participants, 80 third graders and 29 undergraduates, were instructed to read aloud a series of passages and were scored on the rate and accuracy of their reading. Then, they were asked to listen to the questions presented by the examiners and to provide an oral response in their own words.

J. Miller & Schwanenflugel's (2006) study demonstrated that the learners' reading

speed and accuracy had a correlation to their comprehension. Readers with quick and accurate oral reading made fewer and shorter pauses, both at commas and at the end of sentences, whereas readers with emerging reading skill read with lengthy and often inappropriate pausing, both within and between sentences. The basic declarative sentence pauses were unusually long for these less skilled readers.

Saiegh-Haddad (2003) conducted a study on the relevance of Oral Reading Fluency to reading comprehension. The participants were all multilingual in both the J. Miller and Schwanenflugel (2006) and the Saiegh-Haddad studies. However, in the J. Miller and Schwanenflugel study, the participants conducted the process in English; but in the Saiegh-Haddad study, the participants used their native language (L1) and English (L2). The participants in Saiegh-Haddad's study were 50 university students, 22 Arabic and 28 Hebrew native speakers, age range 19–25, enrolled in intermediate-level courses of English as a Foreign Language (EFL). Each participant was asked to read two texts aloud, one in his native language and one in English. After the native Arabic and Hebrew adults read in both their respective L1 and in EFL, Saiegh-Haddad compared their reading fluency and reading comprehension in L1in English. Her study aimed to find out whether there was a difference in the relationship between these two skills in L1 and in L2. Saiegh-Haddad wanted to know whether this relationship differed in groups of

different native language backgrounds.

The results showed that oral reading fluency among adult native speakers of Arabic and Hebrew did not correlate with reading comprehension. Neither speed nor accuracy of reading predicted reading comprehension in Arabic or Hebrew (L1) proficient reading. In other words, the oral reading fluency could not predict the reading comprehension in both Arabic and Hebrew reading. In contrast, in English, oral reading fluency was significantly correlated with reading comprehension. Furthermore, although both accuracy and speed predicted L2 reading comprehension, speed was a stronger predictor.

Saiegh-Haddad's (2003) study indicated a good point that reading aloud could be predicted from reading fluency in some languages but not in other languages. When the Arabic or Hebrew native speakers who were learning EFL read an English (L2) text fluently, the positive correlation of their understanding of the passage might occur. However, when these learners read in Arabic or Hebrew (L1), this positive correlation might not occur. These findings can partly be supported by the J. Miller and Schwanenflugel's (2006) results of multilingual participants doing exams in English (L2): children's reading speed and accuracy had a correlation with their comprehension.

Saiegh-Haddad's (2003) study above was one of the few conducted with second language learners. Another is by Menasche (1977), who conducted an experiment with

twenty EFL native French speakers to examine whether the articulation of sound in reading aloud (L2) had any effect on comprehension. The participants varied in age from 18 to 35, all in low proficiency levels of English. The reading passages were included in a placement exam. The results confirmed that 1) silent reading was more rapid than reading aloud, 2) silent reading was a more efficient means to comprehension, and 3) divided attention, due to the added task of articulation, caused reading aloud to be less efficient. Menasche's study provided a good insight into using silent reading as a rapid means to measure reading comprehension, but this study did not provide evidence to support or deny using oral reading to improve reading comprehension.

Conclusion

This literature review examined the effectiveness of using oral and silent reading to improve students' reading comprehension in native language and foreign learning within three interdependent domains: diagnosing oral reading from Vygotsky's perspectives (Prior & Welling, 2001), comparing oral reading and silent reading (McCallum et al., 2004; S. D. Miller & Smith, 1985), and examining oral reading and reading fluency (Menasche, 1977; J. Miller & Schwanenflugel, 2006; Saiegh-Haddad, 2003).

Studies revealed that oral reading might be a good tool to help students improve their reading comprehension, but the role of language levels and language differences in

students' reading comprehension needs to be carefully examined. Prior & Welling (2001) found that older students scored higher in silent reading than in oral reading, compared with younger students. S. D. Miller & Smith (1985) agreed that lower level readers comprehend better during oral reading than during silent reading, while higher level readers comprehend better during silent reading. On the contrary, McCallum et al. (2004) reported no significant difference between silent readers and oral readers. Subsequently, when oral reading and reading fluency were examined, J. Miller & Schwanenflugel (2006) proclaimed that children's L2 reading speed and accuracy correlated with their comprehension. This finding is partly supported by Saiegh-Haddad (2003), while she concluded that reading speed and accuracy may not predict readers' reading comprehension in every language.

Whereas a significant body of research compares the effectiveness of using oral and silent reading for L1 reading comprehension even though there is no conclusive findings, much less investigation has been done on the L2. As studies have proved that language differences affect the effectiveness of using oral reading to improve comprehension, more analyses are required to determine how the different first languages affect L2 oral reading for EFL learners. EFL learners use different learning strategies to learn a foreign language when compared with native language speakers learning a first

language (Larsen-Freeman & Long, 1991). More studies focusing on EFL learners' reading comprehension with both silent and oral reading are necessary.

Reading Comprehension

Comprehension is the reason for reading. If readers can read the words but do not understand the meaning, they are not really reading. Being able to understand a printed passage is an important academic task and forms the basis for learning in academic subjects (Mayer, 2008). Hannon and Daneman (2001) proposed four main component processes in reading comprehension: accessing relevant knowledge from long-term memory, integrating accessed knowledge with information from the text, making inferences based on information in the text, and recalling newly learned text material. Brown and Palincsar (1989) identified four major reading comprehension skills: (l) generating questions that are answered by the text, (2) identifying words that need to be clarified, (3) summarizing text, and (4) predicting what will come next in a text. When studying reading comprehension, researchers frequently refer to Schema theory. The following section discusses reading comprehension by focusing on Schema theory as well as three kinds of knowledge suggested by Brown, Campione, and Day (1981): content knowledge, strategic knowledge, and metacognitive knowledge.

Schema Theory

Current understanding of cognition is centered in schema theory, derived from the work of Sir Frederick Bartlett (1932), Jean Piaget (Wadsworth, 1971), and Lev Vygotsky (1978; 1986). Piaget defined schemata as "cognitive structures by which individuals intellectually adapt to and organize the environment" (Wadsworth, 1971, p. 19). Schemata receive, sort, classify, and hold information about environmental events and objects; these events and objects comprise our world knowledge and are connected to one another by the logical operations we are capable of performing. Schemata are acquired, extended, and refined as a result of both direct and vicarious experience, and they carry with scripts, or cognitive maps (Shank & Abelson, 1977), that tell us what to expect and how to behave in specific situations. Knowledge accumulated in schemata and scripts helps us see relationships and interrelationships and to function successfully in various contexts. Therefore, the sum of our schemata and scripts can be thought of as our knowledge of the world. The more experience we have and the more accurately and precisely we classify, generalize, differentiate, and predict, the more likely we are able to function successfully in many different contexts (Piaget & Inhelder, 1969, 1973; Ruddell, 1997).

Schema theory is very important to explain the process of reading comprehension

(Sawyer, 2002). The predominant theory informing contemporary researchers' understanding of text comprehension is schema theory, which suggests that reading comprehension is the process of interpreting new information and assimilating and accommodating this information into memory structures, or schemata (Anderson & Pearson, 1984). From this perspective, reading is defined as "the process of constructing meaning through the dynamic interaction among the reader's existing knowledge, the information suggested by the written language, and the context of the reading situation" (Wixson & Peters, 1984, p. 4). In this process, the reader attends to both the content and the structure of the text to construct meaning.

Content Knowledge

One of the most persistent findings in the literature on reading comprehension is that people's prior knowledge about the topic of a passage influences what they remember from that passage (Mayer, 2008). The reader's perspective includes the prior knowledge that the reader uses to understand the passage. What is remembered seems to depend both on what is presented in the passage and on what perspective the reader brings to the reading task. During reading, an individual identifies how text is organized, how one processes text, how the language of text functions, what expectations are reasonable when approaching print, what procedures are useful in interacting with text, and countless

other conventions of text and print (Ruddell, 1997).

Bransford and Johnson (1972) asked college students to read a passage with a given title or no title. The group that had the title before reading had a much higher comprehension score and recalled about twice as much as the other groups. Giving students the title of the passage allowed them to relate the new information to their prior knowledge about the passage. Similar results have been obtained in studies with younger readers. Pearson, Hansen, and Gordon (1979) asked second graders, who were all rated as good readers, to read a passage. Half of them knew a lot about the subject of the passage, and half did not. These results are consistent with the idea that good reading skills are not the sole determinant of what is learned from reading a passage. In addition, the knowledge that the reader brings to the reading situation influences heavily the reader's ability to make inferences about the material. Marr and Gormley (1982) asked fourth graders to read either familiar or unfamiliar passages about sports. They found evidence that prior knowledge tends to enhance readers' inference-making performance more than simple retention of facts.

Armbruster and Bonnie’s (1983) research suggested that younger and less mature readers do not concentrate on textual features because they are not aware of the impact text structures have on learning. Knowledge of text structure is critical for reading to

learn; it is requisite for efficient use of study time. By detecting the organizational patterns or structures of texts, students can observe how authors arrange ideas and determine which kinds of structures are used to interrelate ideas (Muth, 1987).

Ambiguous words or confusion within the text affect reading comprehension in cognitive processing. Experienced readers will adjust their reading rate for anomalous texts and may return to an inconsistent sentence or passage several times, comparing what they know with what is written in the text. Older and more fluent readers are more aware of text inconsistencies and can judge whether or not their comprehension is altered because of such inconsistencies (Tei & Stewart, 1985).

Readers of all ages use their prior knowledge to help them understand what they are reading. A passage may be difficult to comprehend when the reader lacks an appropriate perspective or has a perspective different from that of the writer. Overall, research on the role of prior knowledge in reading comprehension has consistently '"demonstrated strong effects of knowledge on comprehension" (Roller, 1990, p. 83). In summary, reading comprehension depends partly on the content knowledge that the reader brings to the task.

Strategic Knowledge

Using Structure

Knowing how to use the structure of a passage is an important factor of reading comprehension (Mayer, 2008). Research (A. L. Brown & Smiley, 1977, 1978; Gernsbacher, 1990) suggests that skilled readers know about the macrostructure of the passage. They know how the passage may be broken down into main ideas and how the main ideas may be related in a hierarchical outline. Moreover, more able and older readers have a better awareness of the structure of passages that they read as compared to less able or younger readers (van den Broek, Lynch, Naslund, Ievers-Landis, & Verduin, 2003).

Brown and Smiley (1977) broke a story into some idea units and asked third graders, fifth graders, seventh graders, and college students to rate the importance of each idea unit. The third and filth graders were not able to recognize which of the idea units were important and which were unimportant. However, seventh graders, and to a greater extent college students, displayed an awareness of the relative importance of idea units. Brown and Smiley (1978) conducted another study by using the same idea unit design, but asked other adults to recall the information. The results showed that the recall of important information is much better than the recall of unimportant information.

van den Broek, Lynch, Naslund, Ievers-Landis, & Verduin (2003) asked students in grades three, six, nine, and eleven to read a story and then select the best title. van den Broek et al. found that older readers outperformed younger readers on choosing the best title for the story, and readers are much more accurate in identifying the best title when the story is in hierarchical form than sequential form. van den Broek et al.'s study showed that students improved in their ability to identify main ideas over the course of their academic careers. However, even by the end of high school, students still had difficulty with poorly organized passages. Gernsbacher (1990) conducted a study on readers' sensitivity of the structure of a passage. He found that skilled readers spent more time reading the initial sentence in a passage than subsequent sentences. This indicated that the skilled readers paid more attention to topic sentences because they "use those initial sentences to lay a foundation for mental structures representing paragraphs" (p. 5).

Brown and Smiley (1978) provided some evidence concerning the potential trainability of structure-based reading strategies. Fifth, seventh/eighth, and eleventh/twelfth graders were asked to read a short story along with the experimenter. Then students were asked to recall the passage. After the first recall test, students were given a 5-minute study period and told to undertake any activity that would improve recall. The results showed that the extra study time did not have much of an effect on the

younger students but did improve the performance of the older students, particularly on recall of the more important idea units. Apparently, the older students knew to use the study time in order to focus on important information, whereas the younger students did not spontaneously use this strategy.

In a direct training study, Taylor and Beach (1984) taught seventh graders to use a hierarchical summary procedure for reading social studies texts. The results show that each of the trained students showed greater pretest-to-posttest gains in recall and in answering questions than the control group. In training studies, Bean and Steenwyk (1984) found that summarization skills can be taught and learned to improve students' reading comprehension. Walker and Williams (2000) showed that even students with severe learning disabilities can learn reading comprehension skills that transfer to new reading situations.

In sum, reading comprehension can be affected by strategic use of the structure. Skilled readers know the macrostructure of the passage better and older readers usually performed better strategies by learning them in school. Important information from a passage is remembered better than unimportant information. Training of reading strategies is shown to improved learners’ reading comprehension.

Making Inference

The process of comprehending text often requires the reader to make inferences (Mayer, 2008). Inference making is important to reading comprehension that "the ability to draw inferences is a cornerstone of reading competence" (Winne, Graham, & Prock, 1993, p. 53). Weaver and Kintsch (l99l) estimate that as many as a dozen implicit inferences are required to understand every explicit statement in a passage fully. Inference making correlates strongly with measures of reading comprehension. Hannon and Daneman (2001) asked college students to take reading tests, which included a general test of reading comprehension and a test of inference making. The correlation ranged from .40 to .48, indicating a strong positive relation.

Studies (Oakhill & Yuill, 1996; Paris, Lindauer, & Cox, 1977) show that young readers are poor at making inferences during reading. Paris, Lindauer, and Cox (1977) found evidence of a developmental trend in which younger readers are less likely to make inferences during reading than are older readers. They tested kindergartners, second graders, and fourth graders on listening to eight sentences. The kindergartners performed much better with the explicit cue, but the second and fourth graders utilized implicit cues just as well as explicit ones. Their study showed that younger children did not spontaneously go beyond the information given to make and use inferences as well as the

older children. These results suggested that as children develop, they become more able to make inferences that give meaning to their reading.

The volume of a reader's vocabulary strongly affects his inference in reading comprehension. Calvo, Estevez, and Dowens (2003) asked both high-vocabulary and low-vocabulary college students to read sentences. They found that high-vocabulary students spent about half the time rereading the second sentence when it was predictable than when it was not, and less than half of these students would go back and reread the first sentence. However, low-vocabulary students did not show any evidence of making inferences while reading the first sentence. They did not reread the first sentence less often nor spend less time reading the second sentence when the second sentence was predictable. Calvo et al. proposed that readers with larger vocabularies are more likely to find the inferred word in their long-term memory within the short time available, whereas readers with smaller vocabularies need more time to search for an appropriate word in their long-term memory. In this way, a higher order comprehension skill (inference making) depends on a lower level reading skill (accessing word meaning).

Inference training is a central feature of most reading programs (Mayer, 2008). Hansen (1981) developed a program for second graders to practice in answering inference questions. The results showed that an effective way to teach students how to

answer inference questions is to give them direct instruction and practice in answering inference questions. To test the effect of inference training on students' reading comprehension performance, Oakhill & Yuill (1996) provided seven 30-minute training sessions to 7- and 8-year-olds who had scored either low or high on a test of reading comprehension. In the training, students read short stories, discussed answers and then received feedback. The researchers found that for those who had done poorly on the pretest, scores increased greatly for the trained group, but not for a control group that received practice in decoding. For those who had done well on the pretest, the trained group did not show large gains, nor did it gain more than the control group. Overall, these results showed that inference training has a strong effect on students who scored low in reading comprehension. Their study further suggested that the ability to make inferences was a key component in skilled comprehension.

Metacognition Knowledge

Researchers consistently posit that metacognition plays an important role in reading (Collins, 1994). Metacognition has been defined as "having knowledge (cognition) and having understanding, control over, and appropriate use of that knowledge" (Tei & Stewart, 1985, p. 46). Thus, it involves both the conscious awareness and the conscious control of one's learning. Metacognition is the ability to reflect on

one's own cognitive processes. Reflection stimulates metacognition, encouraging learners to identify gaps in their ideas and seek ways to fill the gap (Bjork, 1999; Chi, 1996; Krajcik, Blumenfeld, Marx, & Soloway, 1999; Sawyer, 2002). Brown, Campione, and Day (1981) pointed out that although metacognitive skills are particularly difficult to teach to readers, they are crucial for effective reading.

One kind of metacognitive knowledge related to reading is comprehension monitoring, which is an awareness of whether a reader understands what he is reading (Mayer, 2008). Markman (1979) found that children below grade six have difficulty recognizing spontaneously that the text they are reading is incomprehensible, especially when inconsistencies are implicit; however, older children are more capable of comprehension monitoring. Baker and Anderson (1982) asked college students to read short expository passages, some of which contained inconsistencies. Results showed that readers spent much more time reading a sentence that conflicted with previously presented information compared to reading the same sentence in a consistent passage. In addition, skilled readers were far more likely to look back to an inconsistent sentence. These results suggested that comprehension monitoring was a characteristic of skilled readers. van den Broek et al. (2003) claimed that students who have more working memory capacity use different reading strategies than those with low working memory

capacity. Working memory capacity is the amount of cognitive processing that a person can engage in at anyone time.

Another focus of metacognition in reading comprehension is knowledge of the reading task. For example, locating a specific detail in a text requires a different process than that needed to write a critical analysis of the text. In order for learning to occur, students must be aware that the purpose of reading is to construct meaning (Collins, 1994). The reader must learn how to adapt reading behavior to specific tasks. Rumelhart (1981) suggested three explanations to account for lack of concurrence between reader text and author text: 1) The reader may not have the appropriate schemata. 2) The reader may have the appropriate schemata, but the information available in text may not suggest them. 3) The reader may construct a consistent interpretation of text, but not the one intended. Other researchers (Armbruster & Bonnie, 1983) claimed that learners must first become aware of structures of text, as well as knowledge of the task and their own characteristics as learners, before they can strategically control the learning process to optimize the influence of these factors.

Knowing how to remedy comprehension failures is very important in metacognition. A reader needs knowledge about metacognition strategies. Research (Armbruster & Bonnie, 1983; Tei & Stewart, 1985) indicated that readers use many strategies, but a

distinction exists between good readers and poor readers. Good readers tend to use the most effective strategy that leads to a thorough processing of the text. Readers can be taught to develop self-awareness and control of learning, as research has supported (Schmitt & Hopkins, 1993).

Readers' characteristics are a factor for metacognition in reading comprehension. Readers' characteristics are age and experience dependent. Collins (1994) stated that successful students tend to relate information in texts to previous knowledge; less successful students showed little tendency to use their knowledge to clarify the text at hand. The development of metacognition appears to be linked to proficiency in learning.

To comprehend well a passage is an essential purpose for reading. The above schema theory and knowledge are used to explain the process of reading comprehension in the L1 learning. However, in all cases of successful second language acquisition are characterized by the availability of comprehensive input (Larsen-Freeman & Long, 1991), and studies from L1 learning are directly adopted to explain the comprehensive input for L2 learners, without being questioned their applicability. More studies on L2 learners' reading comprehension need to be conducted, especially ones which focus on the use of reading strategies to facilitate comprehensive input and on reducing the working memory load in metacognition.

Learning Styles

Definition

Research in education suggests that teachers need to become aware that each of their students is unique. A very important aspect of the differences among students is learning styles (Sarasin, 1999). Research in the area of learning style has been active for around four decades and shows that a learning style can be considered as stable over time (Cassidy, 2004).

The concept of learning style has been defined as "a certain specified pattern of behavior and/or performance according to which the individual approaches a learning experience, a way in which the individual takes in new information and develops new skills, and the process by which the individual retains new information or new skills" (Sarasin, 1999, p. 1). Understanding learning style included understanding behaviors when approaching a learning experience, when involved in a learning experience, when evaluating a learning experience, and when applying new information and skills to situations in life.

Riding and Cheema (1991) stated that learning style is usually adopted to reflect a concern with the application of cognitive style in a learning situation. Different from cognitive style, which is bipolar dimension, wholist and analytic, learning style is seen as

encompassing multiple components which are not mutually exclusive. Dunn (1990) explained that research showed that three-fifths of an individual's learning style is biological or genetic. Learning styles are influenced dramatically by personality. Personality traits and characteristics influence the way in which a person interacts with the world, throughout his life. The person's experiences and society exert their influence: s/he adapts learning processes and adopts strategies to succeed.

Research (Sarasin, 1999) suggested that teachers at all levels should understand at least the basics of learning styles. But those who work with postsecondary students must be especially aware of the differences among these styles and combinations, because by adulthood, a person has a fairly well developed learning style.

Different Kinds of Learning Styles

Researchers (Butler, 1988; Gardner, 1993; Gregorc, 1985; Harb et al., 1993; McCarthy, 1990; Sims & Sims, 1995; A. Smith, 1998) used different theories to classify learning styles. The most important five kinds of learning styles are as following: Anthony F. Gregorc (1985) and Kathleen A. Butler (1988) used a theory that identified style in terms of the labels Concrete, Abstract, Sequential, and Random. Gregorc and Butler believed that everyone can be classified into one or a combination of these styles. Ronald R. Sims and Serbrenia J. Sims (1995) proposed a learning style theory that

addressed the individual's processing perspective. They attempted to understand how someone might process new information in order to best understand it, using the classifications Cognitive, Affective, Perceptual, and Behavioral. Bernice McCarthy (1990) placed people in "quadrants" based upon different characteristics. It can be inferred that these characteristics are related to the way people might process information and learn as they progress through life. In her "4MAT Learning Styles Wheel," she used adjectives such as "Analytic" and "Imaginative" and "Dynamic/Common Sensible" as descriptors for different learning styles. John N. Harb, S. Glani Durrant, and Ronald E. Terry (1993) classified learners according to three categories - Reflective/Abstract, Concrete, and Active.

Finally, Gardner (1993) developed his theory of multiple intelligences in 1983. He proposed eight different intelligences to account for a broader range of human potential in children and adults. These intelligences are: linguistic intelligence; logical-mathematical intelligence; spatial intelligence; bodily-kinesthetic intelligence; musical intelligence; interpersonal intelligence; intrapersonal intelligence; naturalist intelligence. Alistair Smith (1998) proposed a model based on Gardner's theory of multiple intelligences. Smith's model assumed that people differ in terms of preferring visual or auditory or kinesthetic modes of learning. Students of different learning styles

may respond to aural and visual messages differently. This approach can be easily translated into strategies in a postsecondary classroom setting (Sarasin, 1999).

Researchers studied how visual and auditory preferences affect students' learning. Studies found that most successful learners utilized both visual and auditory input, but slight preferences one way or the other could distinguish one learner from another (H. D. Brown, 2007). Lepke (1977) reported a study of university students in the United States learning German. He claimed that when students were taught through their preferred modality, they performed better. In another study reported by Lepke (1977), French students at a junior college in Texas not only performed better when they had a choice of modality presentation, but also enrollment in language courses substantially increased.

Levin et al. (1974) observed that many learners could be considered bimodal. Learning via one mode or the other does not contribute appreciably to a difference in outcome. But for a sizeable minority, approximately 25 per cent of all learners, the mode of instruction clearly influences their success as learners.

In one study of adult learners of ESL, Joy Reid (1987) found some significant cross-cultural differences in visual and auditory styles. By means of a self-reporting questionnaire, the subjects rated their own preferences. The students rated statements like "When I read instructions, I learn them better" and "I learn more when I make drawings

as I study" on a five-point scale ranging from "strongly agree" to "strongly disagree." Among Reid's results: Korean students were significantly more visually oriented than native English-speaking Americans; Japanese students were the least auditory students, significantly less auditorily inclined than Chinese and Arabic students. Reid found that some of the preferences of her subjects were a factor of gender, length of time in the United States, academic field of study, and level of education. Later, Reid (1995) reported on studies that included kinesthetic styles with results that confirmed the importance of attending to such preferences among learners.

Characteristics of Visual and Auditory Learners

Visual Learners

Visual learners need to interact visually with new information. Research has given these learners labels such as global, affective, dependent, concept-oriented, field-sensitive, field-dependent, and abstract random or concrete random (Butler, 1988). These students tend to perceive the whole of a concept, rather than just its individual parts. Visual learners are generally group-oriented, respond well to environmental influences or social cues, and work better in informal rather than formal learning situations (Sarasin, 1999).

The visual learning style can be compared to labels used by other researchers. According to McCarthy (1990) and her 4MAT system for identifying learners and their

needs, students with visual strengths or preferences tend to fall somewhere in the quadrant one or four range. These quadrants represent concrete experience skills; such students tend to "Sense and Feel." In Gregorc's (1985) study, the characteristics of visual learners are similar to the Abstract Random learners, who learn holistically and take in information "from all over the place" in order to understand a new concept. In Harb, Durrant, and Terry's (1993) study, the visual style can be related to the concrete and to the active learner.

Auditory Learners

Some descriptions for the auditory learner are the independent learner, the learner who is competitive and achievement-oriented, the learner who has the ability to analyze pieces of information, and the perceptual student, who needs to understand relationships and connections between concepts and pieces of information (Sarasin, 1999). Auditory learners focus on the task or objective at hand. They tend to be more conceptual by nature, concerned with how concepts relate to pieces of information. They are very skill-oriented and memorize things well.

The auditory learning style can be compared to the labels used by other researchers. Learners with auditory strengths tend to fall somewhere in the quadrant two or three range of the McCarthy (1990) 4MAT System for identifying learner needs. These

quadrants represent abstract thinking and conceptualization skills; these quadrants are the "Thinking" quadrants. The characteristics of auditory learners are similar to the Concrete Sequential and Abstract Sequential learners in Gregorc's (1985) study, and to the Abstract and Reflective learners as defined by Harb, Durrant, and Terry (1993).

Identifying Learners' Styles and Strategies

A number of options are available for helping learners to identify their own styles, preferences, strengths, and weaknesses. The most common method is a self-check questionnaire in which the learner responds to various questions, usually along a scale of points of agreement and disagreement (H. D. Brown, 2007). Oxford's (1993) Style Analysis Survey and Wintergerst, DeCapua, and Verna's (2003) Learning Styles Indicator offer classic examples of directing learners to identify their own style preferences.

The most widely used instrument for learners to identify strategies is Rebecca Oxford's (1990) Strategy Inventory for Language Learning (SILL), a questionnaire that has now been tested in many countries and translated into several languages. The SILL's 50 items, divided into six categories, each present a possible strategy. For example, a item in SILL is "I use rhymes to remember new English words." The responders must indicate through rhymes to remember new English words. Once style preferences have

been identified, a learner can proceed to take action through strategies. However, the consistency and reliability of SILL are sometimes questioned by other researchers (LoCastro, 1994, 1995).

A resent study conducted by Slack and Norwich (2007) tested a inventory developed by Smith (1998) on its validity and reliability of learning styles. Even though Smith's learning style model was adapted from Gardner (1993). This inventory only focused on Smith's visual, auditory and kinesthetic styles, not the full set of styles based on Gardner's multiple intelligence model. Slack and Norwich found that the visual and auditory scales are more internally reliable and stable than the kinesthetic scale. These two scales can consistently measure and predict learners' learning styles. There are still some other forms of identifying styles and strategies, including self-reports through interviews (Macaro, 2001), written diaries and journals (Carson & Longhini, 2002; Halbach, 2000) think-aloud protocols (Macaro, 2001; O'Malley & Chalot, 1990).

Conclusion

Learning styles are influenced dramatically by personality, and personality is formed through the person's experiences. Different kinds of models determine a learner's preferred learning styles, which somewhat overlap each other. In this dissertation study, a model developed by Smith (1998) will be adapted. Because slight preferences to visual

and auditory may distinguish one learner from another, and the process of reading aloud and silent reading may have different effects on visual and auditory learners, it is very important to consider all these factors and examine them carefully on their influence on reading comprehension.

Summary

Oral and silent reading has been broadly used in language learning and teaching environments, but previous research has not formed a conclusion on which reading methods are more helpful on learners' reading comprehension. Reading comprehension can be affected by different kinds of factors, such as: learners' previous reading experiences, reading preference, or the text itself. One of the essential factors of reading comprehension is a learner's schema. The learning styles of learners may also be a factor in their reading comprehension. A reader can benefit more from his/her preferred learning styles.

After reviewing these factors of reading comprehension, I found that studies focusing on L2 reading comprehension by examining reading methods and learning styles are lacking. Since L2 learners may have different responses on their reading comprehension because of their diverse learning experiences, a study focusing on the relationship between learners' reading methods and their learning styles in L2 learning is

necessary.

CHAPTER III

METHODOLOGY

Purpose of the Study

The purpose of this study was to measure the relationship of reading methods and learning styles to Taiwanese EFL 12th grade male students' reading comprehension in English. This study addressed the following research questions:

1. To what extent do reading methods affect Taiwanese 12th grade male students' reading comprehension?

2. To what extent do learning styles relate to Taiwanese 12th grade male students' reading comprehension?

Research Design

This study employed a descriptive research design with an instrument of a survey and two Test of English as a Foreign Language (TOEFL) reading passages (Figure 1, p. 4). The purpose of this study was to determine the effects of two different reading methods on EFL students' reading comprehension, and the relationship of learning styles and reading methods to their reading comprehension. The learning styles in this study had two levels: visual learner and auditory learner, with three sub-scale for each: low, medium, and strong; the reading methods in this study had two levels: oral reading and

silent reading.

Through the use of a learning style survey and TOEFL reading passages, this study measured the influence of different reading methods and learning styles on participants' reading comprehension. Each participant was required to complete a survey, with 17 questions in two sections in the survey instrument. The first section was designed to determine students' learning styles. The second section asked students' demographic background related to this study. This survey instrument, adapted from Slack & Norwich's (2007) study, determined the learning styles for each participant.

In the TOEFL reading passages, participants were randomly assigned into two groups: the Oral Reading Group (ORG), and the Silent Reading Group (SRG). In the ORG, students read two TOEFL passages orally; in the SRG, silently. Their reading comprehension scores were used to determine how these two reading methods affected their reading comprehension. The learning styles were compared with their reading comprehension scores to measure the interaction between these two factors.

Participants

The Population

The population of this study was Taiwanese male high school students. The definition of Taiwanese was defined as the student who has been living in Taiwan since

at least the age of six. The following were several purposes for choosing the population in Taiwan as controlled factors:

Public School

Unlike the United States of America, where private schools are for students from high social status families, the most competitive schools in Taiwan are public schools. A public school in Taiwan, receiving funding from the government, usually provides better learning resources for the students. Students need to pass entrance examinations held by a city or a county to enter the public schools. Those who fail to perform well in the examinations only have private schools as their choices. To receive the same degree, students in private schools need to pay much more and receive similar or much fewer resources, compared with students in the public schools. In Taiwan, attending public schools is highly regarded by most students. Therefore, this study focused on public school students.

English Textbooks

The choices of English textbooks for English learners in Taiwan, either in public schools or in private schools, are limited. English textbook publishers in Taiwan need to follow certain specific guidelines (Ministry of Education, 2001). About six publishers

produce English textbooks for elementary schools and junior high schools, and about two publishers produce English textbooks for high schools (Taipei County Government, 2006). Therefore, the choices of English textbooks are very limited and their content is controlled. As studies indicated that the language learning materials affect students' learning process (H. D. Brown, 2007), the limited language learning materials available to Taiwanese high school students served as a good control variable, because of its unification.

English Instructors

In Taiwan, English teachers are required to attend either teachers' colleges or certificate programs offered by certain universities to obtain their teaching certificates before being hired by a public school. The training which these English teachers receive is guided by the Taiwanese government to ensure that the quality of teaching will be controlled. Therefore, in this study, the teaching abilities and strategies used were not a variable.

High School Learners

The reasons for selecting learners from high schools, not from other levels, were as follow: The target test takers of TOEFL, the instrument for this study, were students who

intended to attend colleges or universities in an English speaking country for the Bachelor's or higher degrees. Among these potential test takers, high school students comprised one segment of this population. Compared with undergraduate students and graduate students in Taiwan, high school students had similar language learning backgrounds, which enhanced the accuracy of the results in this study.

The Sample

The study sample included 159 Taiwanese 12th grade male students from four classes in an urban area in southern Taiwan. Students from these four classes were selected under the same English instructor. Students were randomly assigned into two intact groups: an Oral Reading Group (ORG) and a Silent Reading Group (SRG).

Instruments

One survey and two TOEFL reading passages were used for this study. Before the grouping into the ORG and the SRG, the participants needed to complete a survey questionnaire. Then each of participants read two TOEFL reading passages followed by comprehension questions. Each answer sheet of the comprehension questions was coded with the survey by using the same student ID number.

Survey

The survey was organized into two sections: (1) students' learning style and (2)

students' demographic information. A total of 17 questions were asked in this survey. As demonstrated in Appendix A, section one included twelve questions that provided descriptive data on students' learning styles. The questions in section one were adapted from Slack and Norwich's (2007) study, which included 18 questions. Their inventory was developed on the basis of a widely disseminated version (A. Smith, 1998) to be completed by pupil self-report. Their inventory only focused on Smith's visual, auditory and kinesthetic styles, not the full set of styles based on Gardner's (1993) multiple intelligence model. There were six statements for each. Their results show that visual and auditory learning styles can be consistently detected by using these questions, but kinesthetic style can not. Since the kinesthetic learning style was not relevant to this study, only the oral and visual learning style questions from Slack and Norwich's (2007) inventory were adapted. However, in their questionnaire, participants only responded "yes" or "no" to each statement, which showed some limitation of the interpretation of the information. A Likert-scale replaced the yes/no scale.

For each question, a learner had four choices from disagree (1) to agree (4). The number was also the score for that question. Six questions, appearing randomly, were for each learning style. For a learning style, a low score was taken as a score of one to eight on the 24-point scales; medium as nine to 16; and high as 17 to 24. A learner might

receive high scores in one or more areas. Every score was compared with reading comprehension scores to determine the effect of learning styles on the reading comprehension.

TOEFL Reading Passages

The other instruments used to determine the participants' reading comprehension was two TOEFL reading passages. The Test of English as a Foreign Language (TOEFL) was developed in 1963 by the National Council on the Testing of English as a Foreign Language. This was formed through the cooperative effort of more than thirty organizations, public and private. These groups were concerned with testing the English proficiency of nonnative speakers of the language applying for admission to institutions in the United States (Educational Testing Service [ETS], 2008). In 1965, ETS and the College Board assumed joint responsibility for the program.

The TOEFL test measures the ability of nonnative speakers of English to use and understand English as spoken, written, and heard in college and university settings. TOEFL scores are accepted by more than 6,000 colleges, universities, and licensing agencies in 110 countries.

Currently, TOEFL has two kinds of tests: the TOEFL Internet-Based Test (TOEFL IBT) and the TOEFL Paper-Based Test (TOEFL PBT). Both tests have four sections. The

Reading section measures the ability to understand academic reading material. The Listening section measures the ability to understand spoken English as used in colleges and universities. The Speaking section measures the ability to speak English in an academic context. The last section, Writing, measures the ability to write in a way that is appropriate for college and university course work (Educational Testing Service [ETS], 2007).

TOEFL Reading Section

The reading section contains passages on a variety of subjects, followed by several questions. Test takers need to answer from 36 to 70 questions in this section, and they have 60 to 100 minutes to read the passages and answer the questions. The reading passages are similar to what test takers would read and study in North American universities and colleges.

Two passages were selected from the past three years' TOEFL reading section (Appendix B). One was difficult than the other, but their length was matched. The purpose of selecting articles from two reading levels was to measure whether the difficulties would be a factor on the usage of reading method. Studies (Saiegh-Haddad, 2003; Schwanenflugel et al., 2004) showed that compared with silent reading, oral reading takes longer time. In the Silent Reading Group, participants were given 35

minutes to finish the entire test. In the Oral Reading Group, participants were given 50 minutes to finish the entire test.

Reliability

Reliability of Survey

The survey instrument was first designed by Smith (1998), and then was tested for its reliability and validity by Slack and Norwich's (2007). Even though only 12 questions were adapted from the total 18 questions, these 12 questions were tested in Slack and Norwich's study and showed reliable results to determine the learning styles. The internal and re-test reliability coefficients for Visual scales are: Cronbach alpha = 0.63 and Re-test reliability = 0.90. For Auditory scales are: Cronbach alpha = 0.75 and Re-test reliability = 0.96, $p < 0.05$ (n=25). These 12 questions were adapted but changed from Yes/No answers to Likert-scale. The wording of some questions was also changed (Appendix C), which provided better reliability than Slack and Norwich's study. The new internal reliability coefficients for Visual scales are: Cronbach alpha = 0.88 and for Auditory scales are: Cronbach alpha = 0.85.

Reliability of TOEFL reading passages

A continuing program of research related to the TOEFL test is carried out under the direction of the TOEFL Research Committee. Currently, the Committee meets twice

yearly to review and approve proposals for test-related research and to set guidelines for the entire scope of the TOEFL research program. ETS conducts studies on the validity and reliability of TOEFL frequently. Table 1 presents the average section and total score reliability estimates and standard error of measurement (SEM) based on the data from September 2005 to December 2006 (Educational Testing Service [ETS], 2007).

Table 1
Reliabilities and Standard Error of Measurement for TOEFL

Score	Scale	Reliability Estimate	SEM
Reading	0 – 30	0.86	2.78
Listening	0 – 30	0.87	2.40
Speaking	0 – 30	0.90	1.70
Writing	0 – 30	0.78	2.65
Total	0 – 120	0.95	4.88

Validity

In order to ascertain the face and construct validity of the survey questionnaire and the TOEFL reading passages, a panel comprised of 7 educator and EFL Taiwanese high school students read and commented on the instruments (Appendix D). The major suggestions from the panel were (a) changing the 5 Likert scale to 4 Likert scale to avoid the ambiguity, (b) providing Chinese version instead of English version of the survey questionnaire to the students, and (c) adjusting the original dichotomous scoring method of the learning style to the current one. The Chinese version of the survey questionnaire

was translated by the present researcher and proven by the English instructor from the participating classes and one English as Second Language (ESL) professor in the United States of America.

Data Collection Procedures

A public male high school in southern Taiwan was contacted. Participants were chosen from four classes of the 12th grade. This study took place after the second term examinations, and students' twice English term examination scores were asked to serve as potential covariates for the present study. 159 participants were selected for this study. Because most of the participants were under 18 years old, permission letters were signed by their parents or guardian (Appendix E). Before participating in this study, all the participants signed forms to indicate their understanding that they could withdraw at any time during this study (Appendix F), and that the confidentiality and anonymity of the data were maintained.

Survey Section

Before the grouping, each participant was required to fill in a survey questionnaire. Each survey questionnaire was given a number, which matched the participant's student ID number. The survey instrument was distributed to each participant in class. The participants took approximately 10 minutes to finish 17 questions. The survey

questionnaire was collected after 15 minutes. The participants received the result of their learning style test by email after the data collection. Knowing their own learning style can help them understand themselves better and make appropriate plans for their future learning.

Language Test Section

After finishing the survey, the participants as intact groups were randomly assigned into the ORG or the SRG. In the ORG, the researcher/research assistants gave students instructions by announcing that the two language passages should be read aloud. Participants were instructed not to yell aloud the passages, but to use an appropriate volume. After reading aloud each passage, participants answered comprehension questions. When they were answering these questions, they still needed to read them aloud.

To minimize the interruption, the ORG was brought to two language laboratories. Each participant was assigned to an individual station where a machine was attached. After the participants put on the headsets, they could only hear their own voice from the headsets. Four research assistants were trained to handle the ORG. The research assistants needed to ensure the participants read the two reading passages aloud and no interruption happened during the test section. The entire testing time for the ORG was 50

minutes. A bottle of water was provided for each participant in this group. Participants took a 10 minute break between the reading passages.

In SRG, the researcher gave students instructions by announcing that the two language passages should be read silently. The participants were tested in a group without any interruption. The entire testing time for the SRG was 35 minutes. A bottle of water was provided for each participant in this group. Participants took a 10 minute break between the reading passages.

Data Analysis Procedures

Data analysis for this study examined the research questions below:

1. To what extent do reading methods affect Taiwanese 12th grade male students' reading comprehension?

2. To what extent do learning styles relate to Taiwanese 12th grade male students' reading comprehension?

Individual survey responses and the participants' answers to the two TOEFL reading passages were scored and entered to the Statistical Package for the Social Sciences (SPSS).

Descriptive statistics (frequencies, percentages, and where appropriate, means) was used to present quantitative data gathered from responses to research questions. These

data included participants' preferred learning styles, the demographics, and the scores of the passage reading. Depending on the source or type of data, a number of different ways of interpreting the data were utilized. Statistical analyses are performed using SPSS (Statistical Package for the Social Sciences) in order to compare the different groups.

This study was a descriptive design. Analysis of data not only described the reading performance in groups of participants (research questions 1) but also determined the effect of the participants' preferred learning style reading methods on the ORG in contrast to the SRG (research questions 2). Students' English second term examination scores were served as a covariate. These differences in means were compared using the independent samples t-test and a 2x3 analysis of covariance (ANCOVA). This gave information about whether the reading methods and the learning styles had interactions on the reading comprehension.

Protection of Human Subjects

Ethical considerations were addressed by informed consent. The purpose of the study was explicitly stated. I ensured that participants could stop taking the survey or reading test at any time and that they did not have to answer the questions with which they felt uncomfortable. The results of learning styles were available to participants. The participants could benefit from knowing their learning styles to conduct more appropriate

learning plans. The confidentiality and anonymity of the data were maintained. No harm was done to the participants. This research was conducted with voluntary participation. The research involved collecting data or responses from human beings. Hence, approval from the Institutional Review Board for the Protection of Human Subjects (IRBPHS) at the University of San Francisco was obtained (Appendix G).

CHAPTER IV

FINDINGS

Introduction

The present descriptive study examined the relationship of reading methods and learning styles on male Taiwanese 12th grade students' reading comprehension in English. The dependent variable was students' reading comprehension measured by two TOEFL reading passages. Two independent variables were selected for this study. One independent variable was learning style with two levels: visual and auditory learning styles, and each learning style had three sub-scales: low, medium, and high (Figure 1). The other independent variable was reading method with two levels: oral and silent reading methods. Students' English term examination scores were collected before the study and used as a covariate.

159 male Taiwanese 12th grade students from four classes in an urban area in southern Taiwan participated in the present study. The four classes were randomly assigned as intact groups into two larger groups: the Oral Reading Group (ORG) and the Silent Reading Group (SRG). One survey and two TOEFL reading passages were employed for this study. Students were required to complete a survey questionnaire before they read two TOEFL reading passages and finished seven comprehension

questions for each reading passage. The research questions addressed by this study were: 1. To what extent do reading methods affect Taiwanese 12th grade male students' reading comprehension? 2. To what extent do learning styles relate to Taiwanese 12th grade male students' reading comprehension?

Baseline Measures

Two baseline measures determined if there were any differences between and within the ORG and the SRG. The first measure was on participated students' language learning backgrounds, and the second measurement was on the covariates.

Students' Language Learning Backgrounds

This baseline was measured by the second part of the survey instrument that reveals students' demographics. Participants' average age was 17.23 (SD=.48). The average years of learning English as a foreign language were 8.76 (SD=1.31). Among 159 participants, only one participant took the TOEFL previously. Every participant had lived in Taiwan since his 6th birthday. Participants' language backgrounds are shown in Table 2. Among the 159 participants, 159 spoke Mandarin, 138 spoke Taiwanese, 159 spoke English and 10 spoke Hakka (a regional dialect).

Table 2
Languages Students Used

Languages	Numbers n=159	Percentage
Mandarin	159	100
Taiwanese	138	87
English	159	100
Hakka	10	6

This baseline measurement shows that the participants were in a homogeneous group: their ages and language learning backgrounds were controlled.

The Covariate

This study was conducted after students' English second term examination. Their first and second term examination scores (pre-English scores) were expected as covariates. The computation of the correlations between each pre-English score and students' two TOEFL reading passage scores are shown in Table 3. Because the absolute value of r should be at least .20 (Huck, 2008) to be selected as a covariate, only the second English term examination scores were used as the covariate for this study.

Table 3
Covariates Check

	Easy Passage	Difficult Passage
Pre-Eng 1	*r*=.56, sig=.00*	*r*=.15, sig=.07
Pre-Eng 2	*r*=.56, sig=.00*	*r*=.25, sig=.00*

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

Research Question One:

To What Extent Do Reading Methods Affect Taiwanese 12th Grade Male Students' Reading Comprehension?

In Table 4 below, the means and standard deviations for the SRG and the ORG appear to have no difference between the groups for both TOEFL reading passages. When both groups read the easy passage, the mean score in the SRG was 4.84 (SD=1.64) and in the ORG was 4.76 (SD=1.55). When students read the difficult passage, the mean score in the SRG was 3.45 (SD=1.37) and in the ORG was 3.65 (SD=1.20).

Table 4
ANCOVA for the Reading Methods

	Reading Methods								
	Silent Reading			Oral Reading					
	Mean	SD	n	Mean	SD	n	F	*df*	Sig.
Easy Passage	4.84	1.64	77	4.76	1.55	82	.72	1	.40
Difficult Passage	3.45	1.37	77	3.65	1.20	82	.83	1	.36

Note: Statistically significant at .05 level.

This analysis shows that the different reading methods (silent and oral) alone did not affect EFL students' reading comprehension in English: easy passage, $F(1,156)=.72$, $p>.05$; difficult passage, $F(1,156)=.83$, $p>.05$.

Research Question Two:

To What Extent Do Learning Styles Relate to Taiwanese 12th Grade Male Students' Reading Comprehension?

This section presents the interaction of learning styles (visual and auditory) with reading methods (silent and oral). The first part demonstrates the interactions with visual learning style alone, the auditory learning style is examined in the second part, and the last part is the integration of both visual and auditory learning styles.

Visual Learning Style

Reading the Easy Passage

Table 5 shows the interaction between visual learning style and two reading methods, silent and oral, on the easy TOEFL reading passage. There was no difference shown between the SRG and the ORG on reading comprehension on every visual learning style level after the participants read the easy passage: low visual preference, $F(1,18)=1.57$, $p>.05$; medium visual preference, $F(1,31)=.43$, $p>.05$; high visual preference, $F(1,101)=1.21$, $p>.05$.

Students' visual learning levels were not factors in their reading comprehension when they read an easy passage silently, $F(2, 73)=2.97$, $p>.05$. When students orally read an easy passage, their visual learning levels did not affect their reading comprehension,

F(2,78)=1.21, p>.05. This result means that when students used the same reading method to read an easy passage, their visual learning preference did not have an impact on their reading comprehension.

Table 5
The Interaction of Visual Learning Style and Reading Methods on the Easy Passage

Visual Learning Style Scales	Easy Passage Silent M	SD	n	Oral M	SD	n	F	*df*	Sig
Low	4.06	1.77	16	5.20	1.79	5	1.57	(1,18)	.23
Medium	4.69	1.74	16	4.28	1.90	18	.43	(1,31)	.52
High	5.18	1.48	45	4.86	1.41	59	1.21	(1,101)	.28
F	2.97			1.21					
df	(2,73)			(2,78)					
Sig	.06			.30					

Note: Statistically significant at .05 level.

Reading the Difficult Passage

Table 6 shows the interactions between visual learning style and two reading methods, silent and oral, on the difficult TOEFL reading passage. When low visual learners read a difficult passage, they performed better in the ORG than in the SRG and the difference reached the significant level, F(1,18)=4.67, p=.04. The medium visual learners, F(1,31)=0, p>.05 and the high visual learners, F(1,101)=.02, p>.05, showed no difference between the SRG and the ORG after reading a difficult article.

Students' visual learning levels were not factors in their reading comprehension

when they read an easy passage silently, F(2, 73)=1.5, *p*>.05. When students orally read an easy passage, their visual learning levels did not affect their reading comprehension, F(2,78)=2.60, *p*>.05. This finding means that when students used the same reading method to read a difficult passage, their visual learning preference did not have an impact on their reading comprehension.

Table 6
The Interaction of Visual Learning Style and Reading Methods on the Difficult Passage

Visual Learning Style Scales	Difficult Passage: Silent M	SD	n	Oral M	SD	n	F	*df*	Sig
Low	2.94	1.77	16	4.80	1.30	5	4.67	(1,18)	.04*
Medium	3.50	1.41	16	3.50	1.38	18	.00	(1,31)	1.00
High	3.62	1.17	45	3.59	1.10	59	.02	(1,101)	.90
F	1.5			2.60					
df	(2,73)			(2,78)					
Sig	.23			.08					

*Statistically significant at .05 level.

The cell means from Table 5 and 6 are graphed on Figure 2, which shows that low visual learners performed better on oral (n=5) than silent (n=16) on both easy and difficult passages, but only the difficult passage reached the significant level.

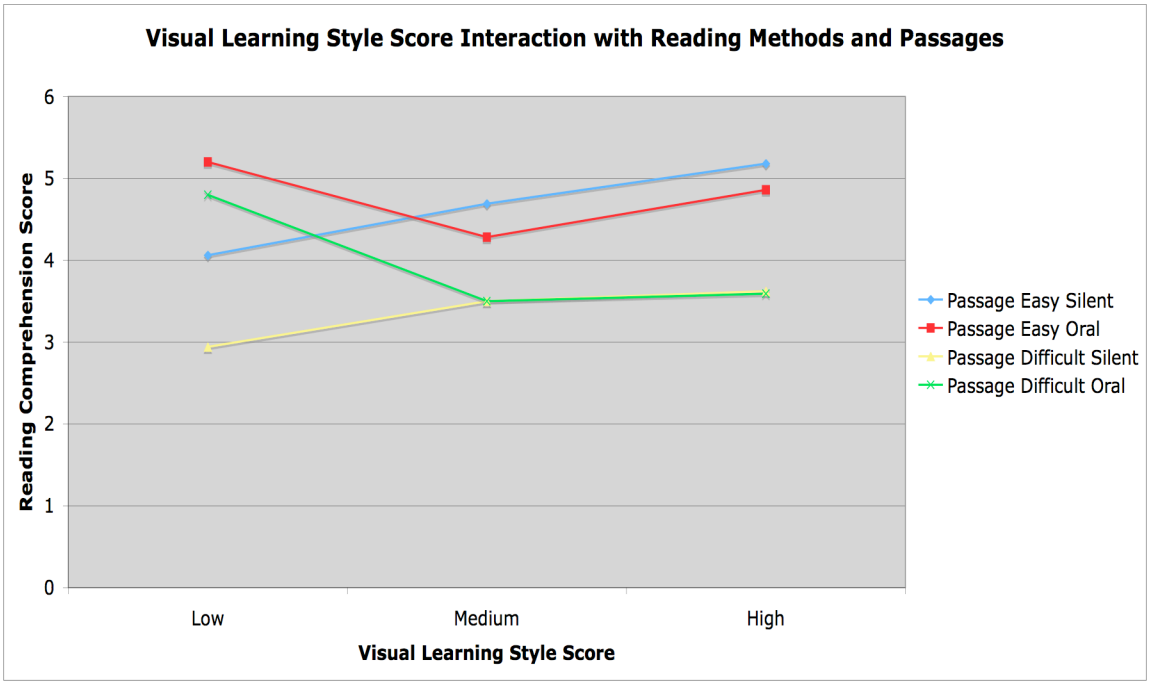

Figure 2. The Means of Interaction Between Visual Learning Style and Reading Methods

In the ORG, these low visual learners' auditory learning levels were: low (n=1), medium (n=2), high (n=2). Therefore, their auditory learning levels were not factors in their reading performance. Their English ability, estimated by their English term examinations (Table 7), might partially explain their performance. However, the covariate from the English second term examination already adjusted the means of the reading comprehension scores. This factor was already controlled. Based on the previous discussion on visual learning style, Table 8 shows the preferred choice of the reading methods for every visual learning level on reading passages.

Table 7

English Term Examination scores of the Low Visual Learners Compared with the Entire Participants

English Term Exam Scores	Auditory Level					Mean n=159	SD n=159
	Low	Medium	Medium	High	High		
Pre-Eng 1	81	91	74	45	81	65.80	19.33
Pre-Eng 2	78	85	77	36	68	64.95	18.79

Table 8

Choices of Reading Methods for Visual Learners in Every Level

Visual Level	Easy Passage	Difficult Passage
Low Visual	Both[1]	Oral[2]
Medium Visual	Both	Both
High Visual	Both	Both

[1]"Both" means participants can use both silent and oral reading methods

[2]"Oral" means participants may perform better by choosing oral reading method

Auditory Learning Style

Reading the Easy Passage

Table 9 shows the interactions between auditory learning style and two reading methods, silent and oral, on the easy TOEFL reading passage. In this analysis, students in both reading groups did not show any significant difference in their reading comprehension, for the low auditory learners, $F(1,29)=2.61$, $p>.05$; the medium auditory learners, $F(1,38)=.00$, $p>.05$; the high auditory learners, $F(1,83)=.03$, $p>.05$.

Table 9
The Interaction of Auditory Learning Style and Reading Methods on the Easy Passage

Auditory Learning Style Scales	Easy Passage								
	Silent			Oral					
	M	SD	n	M	SD	n	F	*df*	Sig
Low	4.59	1.81	17	3.53	1.89	15	2.61	(1,29)	.12
Medium	4.69	1.72	26	4.67	1.68	15	.00	(1,38)	.96
High	5.09	1.51	34	5.13	1.22	52	.03	(1,83)	.88
F	.69			7.18					
df	(2,73)			(2,78)					
Sig	.51			.00*					

Note: Statistically significant at .05 level.

When using the silent reading method to read an easy passage, students did not perform differently in their reading comprehension in each auditory learning style sub-scale, $F(2, 73)=.69$, $p>.05$. In the ORG, students' auditory learning style levels affected their reading comprehension when they read the easy passage, $F(2,78)=7.176$, $p<.01$. Significant differences between each auditory learning style level were examined using Tukey HSD post-hoc tests, which showed the only statistically significant group difference that remained was between the low and high levels ($M_{Low}=3.53$, $M_{High}=5.13$, $p<.001$). With the high auditory learning style level, students performed better in reading comprehension when they read aloud the easy passage.

Reading the Difficult Passage

Table 10 shows the interactions between auditory learning style and two reading

methods, silent and oral, on the difficult TOEFL reading passage. In this analysis, students in both reading groups did not show any significant difference on their reading comprehension, for low auditory learners, $F(1,29)=.16$, $p>.05$; medium auditory learners, $F(1,38)=.13$, $p>.05$; high auditory learners, $F(1,83)=1.18$, $p>.05$. When students used the same reading method to read a difficult passage, their auditory learning preference did not have an impact on their reading comprehension, in the SRG, $F(2,73)=2.02$, $p>.05$ and in the ORG, $F(2,78)=2.64$, $p>.05$.

Table 10
The Interaction of Auditory Learning Style and Reading Methods on the Difficult Passage

Auditory Learning Style Scales	Difficult Passage								
	Silent			Oral					
	M	SD	n	M	SD	n	F	*df*	Sig
Low	2.88	1.50	17	3.07	1.30	15	.16	(1,29)	.69
Medium	3.69	1.29	26	3.53	1.38	15	.13	(1,38)	.77
High	3.56	1.33	34	3.85	1.10	52	1.18	(1,83)	.28
F	2.02			2.64					
df	(2,73)			(2,78)					
Sig	.14			.08					

Note: Statistically significant at .05 level.

Figure 3 shows the cell means from Table 9 and 10, which graphs the interaction between the auditory learning style and reading methods. There was no significant difference shown in both SRG and ORG for every auditory preference level after the participants

read the two TOEFL reading passages. Based on the previous analysis on the auditory learning style, Table 11 shows the preferred choice of the oral or the silent reading for every auditory learning level on reading passages in two difficulties.

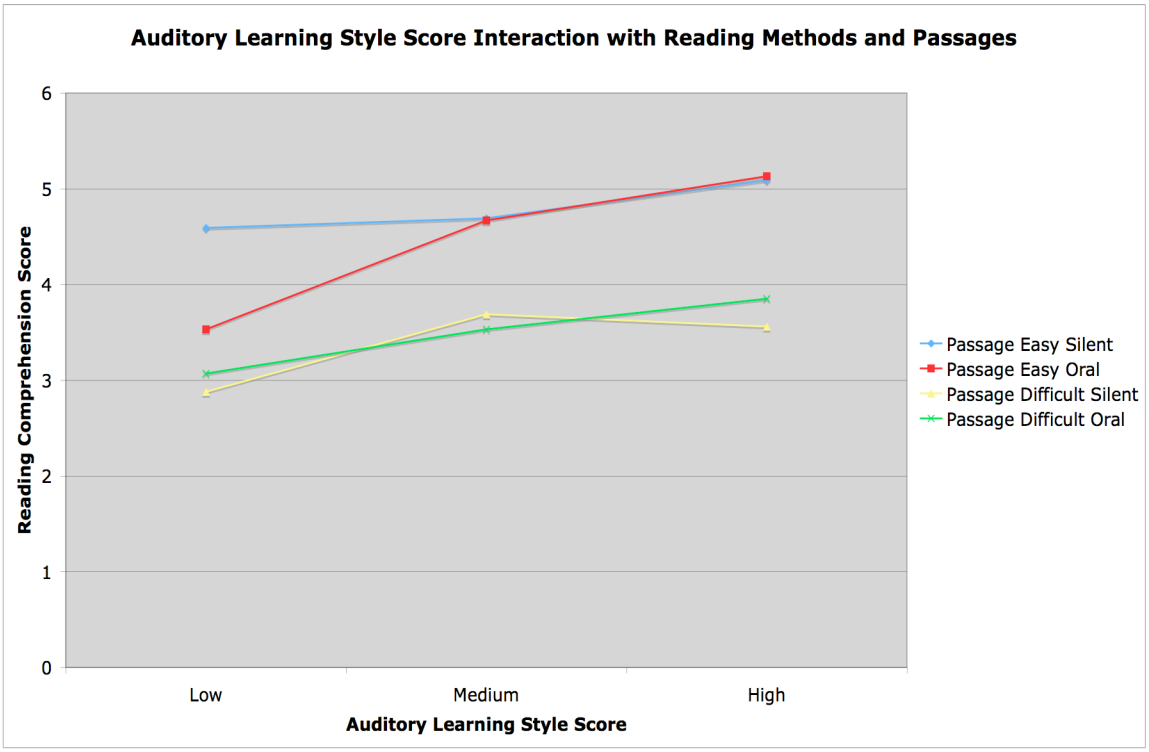

Figure 3. The Means of Interaction between Auditory Learning Style and Reading Methods

Table 11

Choices of Reading Methods for Auditory Learners in Every Level

Auditory Level	Easy Passage	Difficult Passage
Low Auditory	Both[1]	Both
Medium Auditory	Both	Both
High Auditory	Both	Both

[1] "Both" means participants can choose both silent and oral reading methods

The Interactions of Learning Styles and Reading Methods

The choices for both visual and auditory learners shown on Table 8 and Table 11 are reorganized in Table 12 by combining two kinds of learning styles into one. In Table 12, "both" means participants can choose both silent and oral reading methods and "oral" means participants can choose oral reading to obtain better reading comprehension.

Table 12
The Combination of Visual and Auditory Learning Styles

Learning Style Scales	Easy Passage	Difficult Passage
$Low Visual Low Auditory$	Both[1]	Oral[2]
$Low Visua Medium Auditory$	Both	Oral
$Low Visua High Auditory$	Both	Oral
$Medium Visual Low Auditory$	Both	Both
$Medium Visual Medium Auditory$	Both	Both
$Medium Visual High Auditory$	Both	Both
$High Visual Low Auditory$	Both	Both
$High Visual Medium Auditory$	Both	Both
$High Visual High Auditory$	Both	Both

[1] "Both" means participants can choose both silent and oral reading methods

[2] "Oral" means participants can choose oral reading to obtain better reading comprehension

Table 13 and 15 below summarize a series of t-tests that analyze participants' reading comprehension based to their learning styles. Not every learning style had enough participants to do the comparison. Table 13 shows when reading an easy passage, participants with high visual and low auditory learners performed significantly better in

silent reading than in oral reading, $t(13)=2.67$, $p=.02$. In Table 16, when reading a difficult passage, participants with medium visual and high auditory learning style levels performed significantly better in silent reading than in oral reading, $t(9)=2.23$, $p=.05$. However, when the results of the Tale 13 and 14 were compared with Table 12, the findings did not match. Whatever marked "significance" in the Table 13 and 14 was shown "both" in the Table 12. The differences between these tables were caused by 1) the small number of participants in each group and 2) multiple uses of t-tests. Therefore, this significance might happen by chance.

Table 13

t-tests for The Interactions of Learning Styles and Reading Methods on the Easy Passage

Learning Style Scales	Easy Passage								
	Silent			Oral					
	Mean	n	%	Mean	n	%	F	*df*	Sig
$L_{ow}V_{isual}L_{ow}A_{uditory}$	3.90	10	13	7.00	1	1	-	-	-
$L_{ow}V_{isua}M_{edium}A_{uditory}$	4.25	4	5	5.50	2	2	6.00	3	.34
$L_{ow}V_{isua}H_{igh}A_{uditory}$	4.50	2	3	4.00	2	2	-	-	-
$M_{edium}V_{isual}L_{ow}A_{uditory}$	5.00	1	1	2.50	4	5	-	-	-
$M_{edium}V_{isual}M_{edium}A_{uditory}$	4.42	12	15	4.80	5	6	.06	14	.70
$M_{edium}V_{isual}H_{igh}A_{uditory}$	5.67	3	4	4.78	9	11	.02	9	.41
$H_{igh}V_{isual}L_{ow}A_{uditory}$	5.67	6	8	3.60	10	12	.33	13	.02*
$H_{igh}V_{isual}M_{edium}A_{uditory}$	5.20	10	13	4.38	8	10	.00	15	.33
$H_{igh}V_{isual}H_{igh}A_{uditory}$	5.07	29	38	5.27	41	50	1.10	67	.51
Total		77			82				

*Statistically significant at .05 level.

Table 14

t-tests for The Interactions of Learning Styles and Reading Methods on the Difficult Passage

Learning Style Scales	Difficult Passage								
	Silent			Oral					
	Mean	n	%	Mean	n	%	F	*df*	Sig
$L_{ow}V_{isual}L_{ow}A_{uditory}$	2.60	10	13	4.00	1	1	-	-	-
$L_{ow}V_{isua}M_{edium}A_{uditory}$	3.50	4	5	5.50	2	2	.12	3	.28
$L_{ow}V_{isua}H_{igh}A_{uditory}$	3.50	2	3	4.50	2	2	-	-	-
$M_{edium}V_{isual}L_{ow}A_{uditory}$	3.00	1	1	2.25	4	5	-	-	-
$M_{edium}V_{isual}M_{edium}A_{uditory}$	3.83	12	15	3.20	5	6	.41	14	.39
$M_{edium}V_{isual}H_{igh}A_{uditory}$	2.33	3	4	4.22	9	11	.27	9	.05*
$H_{igh}V_{isual}L_{ow}A_{uditory}$	3.33	6	8	3.30	10	12	.15	13	.94
$H_{igh}V_{isual}M_{edium}A_{uditory}$	3.60	10	13	3.25	8	10	2.88	15	.55
$H_{igh}V_{isual}H_{igh}A_{uditory}$	3.69	29	38	3.73	41	50	.30	67	.88
Total		77			82				

*Statistically significant at .05 level.

Summary of the Results

The present study examined the relationship of reading methods and learning styles to Taiwanese EFL 12th grade male students' reading comprehension in English. The first research question was: To what extent do reading methods affect Taiwanese 12th grade male students' reading comprehension. The results show that when students' learning styles were unknown, there was no statistically significant difference on EFL students' reading comprehension between the SRG and the ORG.

The second research question was: To what extent do learning styles relate to Taiwanese 12th grade male students' reading comprehension. When low visual learners

read a difficult passage, they performed better in the ORG than in the SRG and the difference reached the significance, $F(1,18)=4.67$, $p=.04$. When the low visual learners read the easy passage, the difference between the SRG and the ORG did not reach statistical significance. For medium visual learners, there was no difference between the SRG and the ORG either on the easy or the difficult passages, the same for the high visual learners.

Low auditory learners performed no differently between the silent and the oral reading on the easy passage, neither on the difficult passage. For medium auditory learners, there was no difference shown between the SRG and ORG either on the easy or the difficult passage, the same for the high auditory learners.

The present study finds that the SRG performed no differently between each visual learning preference level after reading two passages, and the same results were for the auditory learning preference. In the ORG, students' auditory learning style levels affected their reading comprehension after they read the easy passage, $F(2,78)=7.18$, $p<.001$, but not after they read the difficult passage. Students' visual learning style levels were not factors on their reading comprehension in the ORG.

Regarding the interactions of learning styles and reading methods, two types of learning styles reached statistical significance: when reading an easy passage, participants

with high visual and low auditory learners performed significantly better in silent reading than in oral reading, $t(13)=2.67$, $p=.02$. When reading a difficult passage, participants with medium visual and high auditory learning style levels performed significantly better in silent reading than in oral reading, $t(9)=2.23$, $p=.05$. However, this significance might happen by chance. With the findings cited above, the conclusions of the study, discussions and implications for professional practice, and recommendations for future research are presented in Chapter V.

CHAPTER V

DISCUSSIONS, RECOMMENDATIONS AND CONCLUSION

Introduction

In this chapter the results of the research are discussed within the context of the study itself and within the overall body of research to which it relates. First, the research problem is restated to serve as an impetus for the research. This is followed by a discussion of the key findings of the study and how these findings relate to those of previous research. Next, the implications of this research are discussed. Then, limitations on how the results should be interpreted are presented. Lastly, the recommendations for future study are provided. A summative presentation of the research in its entirety is included at the end of the chapter.

Restatement of the Problem

In English as a Foreign Language (EFL) settings, language teachers frequently suggest students read English passages aloud in class or in private. However, when students have different learning styles, can reading passages aloud, compared with silent reading, help EFL students' reading comprehension? This issue has not been addressed in previous research. To have better understanding of this issue, the present descriptive research study examined the following two research questions: 1. To what extent do

reading methods affect Taiwanese 12th grade male students' reading comprehension? 2. To what extent do learning styles relate to Taiwanese 12th grade male students' reading comprehension?

Discussion of the Findings

The present study examined the interaction of reading methods and the learning styles to Taiwanese 12th grade male EFL students' reading comprehension. 159 participants from four matched classes were selected and randomly assigned as intact groups into an oral reading group (ORG) and a silent reading group (SRG). A learning style survey was adapted to examine students' learning styles and two TOEFL reading passages were used to test their English reading comprehension. Students' English second term examination scores were used as a covariate.

Research Question One

The first research question analyzed the reading methods alone to see how they affected the EFL students' English reading comprehension. After the control of the factors that were discussed in Chapter III, such as: age, language proficiency and language learning background of the participants (Martí, 1996; Prior & Welling, 2001), as well as the content and the strategic knowledge (Mayer, 2008; Ruddell, 1997) to the reading passages, the results show that using different reading methods, silent and oral,

did not have statistically significant differences on EFL learners' reading comprehension. With full score at 7, when both groups read the easy article, the mean score in the SRG was 4.84 (SD = 1.64) and the ORG was 4.76 (SD = 1.55). When students read the difficult article, the mean score in the SRG was 3.45 (SD = 1.37) and the ORG was 3.65 (SD = 1.20). This result is consistent with McCallum, Sharp, Bell, and George's (2004) finding for L1 learners: no significant difference between the silent and the oral readers. In other words, the results of Research Question One show that oral and silent reading methods are not factors in EFL students' reading comprehension.

Research Question Two

The second research question was: To what extent do learning styles relate to Taiwanese 12th grade male students' reading comprehension? This question examined the relationship between learning styles and reading methods.

Learning Styles: Medium to High Preference

Researchers (Cassidy, 2004; Sarasin, 1999) stated that visual learners' learning style match the school's paper and pencil tests, which is the method used in the present study for the silent reading. Then, would high visual learners perform better in the SRG than the ORG? The answer is no. For medium to high visual and auditory learners, there was no difference shown between the SRG and the ORG on either the easy or the

difficult passage (Table 5, 6, 8, and 12).

The participants who had medium to high preferences to visual learning style were overlapping the participants in the auditory learning styles with medium to high preferences at 74%. In other words, 117 out of 159 participants had at least medium preference for visual and auditory learning styles. Therefore, their performance on the reading passages in both SRG and ORG was quite similar. This finding corresponds to H. D. Brown's (2007) statement: most successful learners have high preference to both visual and auditory learning styles and utilize both inputs.

Another concern regarding the high auditory learners is that when auditory learners are those who learn best through hearing things (McCarthy, 1990; Sarasin, 1999), why did they not perform better in the ORG than in the SRG? Vygotsky's (1986) egocentric and communicative speech theory can explain this. He perceived that forcing a competent silent reader to read out loud would focus attention on phonetics and word/phrases other than predicates. The difficulties of the article, such as: new words, new concepts, or syntax (A. L. Brown et al., 1981; A. L. Brown & Palincsar, 1989; Hannon & Daneman, 2001), had a larger impact on students' reading comprehension than the reading methods. Even though Vygotsky's theory was designed for L1 learners, it seems to be supported by this study for L2 learners. Therefore, the results indicate that for high auditory EFL

learners, their strength of having better understanding through hearing things is counteracted by the distraction of oral reading.

Learning Styles: Low Preference

The impact of reading methods on the low visual learners was large, especially when they read a difficult passage. For the low visual learners, they performed better on oral (n=5) than silent (n=16) reading on both easy and difficult passages, and the difficult passage reached the significant difference, $F(1,18)=4.67$, $p=.04$. According to the analysis in the Chapter IV, these low visual learners' auditory learning levels were not factors in their reading performance, and their English ability was also not a factor. Therefore, this finding suggests that reading a difficult passage aloud has a high likelihood to help low visual learners attain better reading comprehension. The explanation of this significant difference may be as follows: Table 8 shows students with any visual learning style can benefit from both silent and oral reading on reading two difficult level passages, except for the low visual learners on reading the difficult passage. Low visual learners are those who have no preference for interacting visually with new information (Butler, 1988), which also means they could not equally benefit from both oral and silent reading. While silent reading associates more with the visual learning style, oral reading has a stronger relationship to the auditory learning style.

Therefore, when students' silent reading ability declines, their better choice of the reading methods will be oral reading. This subtle choice shift only happened on the difficult passage, because students' other abilities for reading comprehension, such as: schema (Sawyer, 2002), content knowledge, strategic knowledge, and metacognition knowledge (A. L. Brown et al., 1981), could still cover the difficulty level of the easy passage.

In contrast to the low visual learners, the difference between oral and silent reading did not appear for the low auditory learners. After the low auditory learners read the difficult passage, their raw scores in the ORG (M=3.07, SD=1.3) were slightly higher than the SRG (M=2.88, SD=1.5). However, when they read the easy passage, the row score in the SRG (M=4.59, SD=1.81) was higher than the ORG (M=3.53, SD=1.89), but the difference did not reach the significant level, $F(1,29)=2.61$, $p=.12$. The findings indicate that different reading methods do not have an impact on low auditory learners' reading comprehension. The explanation of this finding may be as follows: if using the same reasoning as the low visual learning style, low auditory learning style students might have benefited more from silent reading, but the result showed that they did not perform differently on both reading methods. The possible reason might be that the low auditory students still benefited from the oral reading. However, the number of

participants in the SRG were 17, and 15 in the ORG. A larger sample size is needed to examine this finding.

Sub-level Comparisons

The sub-level here means the low, medium, and high levels in the visual learning style and the auditory learning style. The present study found no significant difference between each visual learning preference level after the SRG read two passages; the same results were for the auditory learning preference in the SRG. The finding means the strength of the learning preference did not affect EFL learners' reading comprehension. This also means the difficulty of the reading passages had a larger impact on EFL students' reading comprehension than did the silent reading.

In the ORG, students' visual learning preference was not a factor in their reading comprehension: the easy passage, $F(2,79)=1.21$, $p>.05$; and the difficult passage, $F(2,79)=2.6$, $p>.05$. This finding proves that there was no interaction between the visual learning style and the oral reading method.

After students orally read the easy passage, their auditory learning style levels significantly affected their reading comprehension, $F(2,79)=7.18$, $p<.01$, and the difference was between the high auditory learners and the low auditory learners. This can be interpreted as that auditory learners can benefit more from oral reading, compared

with non-auditory learners. This interpretation corresponds with the learning style theory: auditory learners are those who learn best through hearing things (McCarthy, 1990; Sarasin, 1999). The present findings also indicated that students can do better on their preferred learning style, compared with their non-preferred learning style. This responds to Lepke's (1977) study which shows that French ESL students performed better when they had a choice of modality presentation, and the enrollment in language courses also increased.

The significant difference in the easy passage did not happen with the difficult passage. After students orally read the difficult passage, their auditory learning style levels were not factors on their reading comprehension. This finding indicates that the challenge of the difficult passage had a larger impact on students' reading comprehension than did the different auditory learning preference.

The explanations of the difference in the situations between the easy and the difficult passages can again refer to Vygotsky's (1986) egocentric and communicative speech theory: forcing a competent silent reader to read out loud would focus attention on phonetics and word/phrases rather than predicates. For passages of some difficulty, reading aloud can help the auditory learners' reading comprehension, but if the difficulty is too overwhelming, the learners' privilege of auditory learning preference on their

reading comprehension is counteracted by the distractions.

Interaction Effects: Learning Styles and Reading Methods

Table 13 and 14 show that many participants fall into the high visual and high auditory category, the SRG n=29; the ORG n=41. This result is supported by H. D. Brown's (2007) statement: most successful learners have a high preference for both visual and auditory learning styles and utilize both inputs.

Regarding the interaction of learning styles and reading methods, two types of learning styles reached statistical significance:

1. After reading an easy passage, the high visual and low auditory (HVLA) learners performed significantly better in silent (n=6) reading than in oral (n=10) reading, $t(13)=2.67$, $p=.02$.
2. After reading a difficult passage, the medium visual and high auditory (MVHA) learners performed significantly better in silent (n=3) reading than in oral (n=9), reading, $t(9)=2.23$, $p=.05$.

However, according to the analysis in Chapter IV (pp.77-81), there was no strong reason to support this significant difference. Therefore, the differences might happen by chance, showing that further in depth research is required.

Implications

For Learning Style Survey Users

The learning style survey used in this study was adapted from Slack and Norwich's (2007) research study. Only12 questions were selected from the total 18 questions to measure participants' Visual and Auditory learning preferences. The major modifications from the original survey were (a) changing wording of some questions to better describe EFL students' learning situations, (b) switching the 5 Likert scale to 4 Likert scale to avoid the ambiguity, (c) providing Chinese version instead of English version of the survey questionnaire to the students, and (d) adjusting the original dichotomous scoring method of the learning style to the current one (Appendix C).

In Slack and Norwich's study, the internal reliability coefficients for Visual scales were Cronbach alpha = 0.63 and for Auditory scales were 0.75 (n=25). The modified survey questions provided better reliability than Slack and Norwich's study. The new internal reliability coefficients for Visual scales are: Cronbach alpha = 0.88 and for Auditory scales are 0.85 (n=159). The modified learning style survey provided high internal reliability on both Visual and Auditory learning styles by using only 6 questions for each learning style. The learning style survey users can benefit from the present study by adopting the newly developed learning style survey on their research or teaching.

For EFL Instructors

Instructors in the EFL field can benefit from the present study by carefully designing the proper usage of different learning methods to teach adolescent and adult EFL learners. If students' learning styles are unknown, there is no difference showing which reading method is better than the other. Therefore, based on his/her teaching need, an EFL instructor can assign an oral or silent reading activity as group work.

If students' learning styles are known, an instructor can pay more attention to the teaching plan design based on these simple guidelines:

1. Designing oral reading activities for the high auditory learners on an easy passage reading.
2. Selecting oral reading activities for the low visual learners on a difficult reading passage.
3. For other learning style preferences, the performance of reading comprehension in oral reading and silent reading will not make a difference.

Based on the significant findings of learning styles and reading methods on auditory learners and low visual learners, Table 12 can be adjusted as Table 15 for practical uses. An instructor may design oral reading activities especially for his/her low visual EFL learners on a difficult passage reading and for high auditory EFL learners on an easy

passage reading. Otherwise, the EFL teachers can select either silent or oral reading activities for other students.

Table 15
The Choices of Reading Methods for Different Learning Styles

Learning Style Scales	Easy Passage	Difficult Passage
$L_{ow}V_{isual}L_{ow}A_{uditory}$	Both[1]	Oral[2]
$L_{ow}V_{isua}M_{edium}A_{uditory}$	Both	Oral
$L_{ow}V_{isua}H_{igh}A_{uditory}$	Oral	Oral
$M_{edium}V_{isual}L_{ow}A_{uditory}$	Both	Both
$M_{edium}V_{isual}M_{edium}A_{uditory}$	Both	Both
$M_{edium}V_{isual}H_{igh}A_{uditory}$	Oral	Both
$H_{igh}V_{isual}L_{ow}A_{uditory}$	Both	Both
$H_{igh}V_{isual}M_{edium}A_{uditory}$	Both	Both
$H_{igh}V_{isual}H_{igh}A_{uditory}$	Oral	Both

[1]"Both" means participants can use both silent and oral reading methods

[2]"Oral" means participants may perform better by choosing oral reading method

The results of this study suggest that most students can benefit from both silent and oral reading activities, and only some students benefit more from oral reading. An EFL teacher can be more flexible in selecting different reading methods to enrich his/her teaching activities. For example, an EFL teacher can gather similar learning style learners into small groups and assign different reading tasks by using the effective reading methods for each group. Students can improve their reading comprehension by using their preferred reading methods.

For EFL Learners

Most adolescent and adult EFL learners can choose either oral or silent reading to help their reading comprehension. However, for low visual EFL learners and high auditory EFL learners, oral reading may be a better choice for the former with a difficult passage reading and the latter with an easy passage reading.

For Curriculum Planners

In EFL settings, most students are rarely tested for their learning styles. However, the learning styles do have an impact on their foreign language learning. Curriculum planners can encourage language teachers to perform a learning style test during the first class. Then, the language teachers can adjust his/her teaching plan based on the students' composition. Curriculum planners can also encourage EFL teachers to be flexible in the selection of reading methods.

Limitations

The limitations set on interpreting the findings of this research are divided into two sections. Limitations associated with the sample's demographic characteristics, native language and English proficiency is presented first. These are followed by the methodological limitations associated with the sample selection and assignment and the use of self-reported measures.

Sample

The study was conducted in a major metropolitan area in southern Taiwan. The demographic characteristics of the subject population were homogeneous and exclusive of age, ethnicity, gender, and native Chinese language. The results of the study should be considered within the context of the demographic characteristics. Specifically, the findings may differ for other language groups, e.g. ESL students or students with other first languages. The results of this research should be considered within the context of the degree of students' English ability as well as the gender issue. The results of the study should be interpreted within the context of the EFL domain.

To increase statistical power, the sample size for similar research should be increased to assure a larger number of participants for each learning style sub-scale group. This could be accomplished either by increasing the total potential subject pool or increasing the percentage of participation within a similarly sized pool. A larger sample of participants for each learning style sub-scale group would increase the statistical power and might provide greater insight into the differences between reading methods and learning styles.

Methodology

Randomization

The use of intact groups did not allow for random selection of subjects; however, each intact group was randomly assigned to a reading method. While this does not satisfy the conditions for random assignment, it does improve the generalizability of the results across content domains. Still, the results of this research should be interpreted with the understanding that the conditions for the study did not allow for complete randomization.

Instrumentation

The use of self-reported measures of the learning style survey introduced bias into the data collection process that made it difficult to draw accurate conclusions from what may be inconsistent results between subjects. That said, it was impossible to directly measure the affective disposition itself and therefore it had to be inferred from devised measures.

The use of anonymous self-report inventories along the lines originated by Likert (1932) has been validated as an acceptable strategy for assessing students' affective status. Therefore, in the entire study, students were only asked to provide their student ID. No name was asked. At the same time, in order to draw accurate inferences about a student's affective status based on their responses to self-report inventories, it was necessary to

assume that each student responded truthfully to the items that comprised the inventory. Unfortunately, students tend to provide socially desirable responses to affective self-report devices. To counter such responses, the participants were told their learning styles in emails that may help them know more about themselves and plan better learning strategies. Although these assurances could not guarantee that all students responded truthfully, these procedural techniques increased the probability that students responded honestly (Popham, 2000).

Recommendations for Future Study

The findings of this study certainly encourage additional research on the topic. Several different replications of the study would be recommended. For comparison purposes, a replication of the study in other EFL settings with different first languages would be worthwhile because the first languages influence students' learning of a foreign language. Then they may also have some impact on students' performance on different reading methods. Another replication could be initiated in a similar all-girls setting. In Taiwan, top schools are single sex high schools. A replication in an all-female school setting would provide data regarding questions about gender difference. Another question that needs investigation is the extent to which the subject matter influenced the results. If the study were done using science, math, or Chinese, as the given subject, would the

interaction of learning styles and reading methods be different? A study that explored the age differences on the implication of learning styles and reading methods would be informative and the impact beneficial to instructions and learning.

Regarding the lack of participants in some categories of the interaction of learning styles and reading methods in this present study, a larger sample size would generate more participants for different sub-scales to receive more significant results. Moreover, a random sample would yield data that may be more reliable.

Lastly, this study recommends to those EFL field researchers and instructors to explore the implementation of technologies in teaching. Teaching with technologies can be more personalized to assist students' different learning styles. In relation to this, future research may also consider the schools' plans and initiatives for teacher development in the use of computer-based technology in the EFL classrooms. This would undoubtedly contribute to a better understanding about the development, implementation, and integration of various technologies in the EFL classroom setting for different learning style students.

Summary

The purpose of the research was to examine the relationship of two kinds of reading methods (oral reading and silent reading) and two types of learning styles (visual

and auditory) of Taiwanese EFL 12th grade male students' reading comprehension in English. How the reading methods and learning styles influence the learners' reading comprehension in EFL settings had not been examined prior to this research.

A descriptive methodology was used with a sample of 159 students at a male high school in southern Taiwan. Students from four intact classes were randomly assigned into two groups: the Oral Reading Group (ORG) and the Silent Reading Group (SRG). One survey and two TOEFL reading passages were employed for the present study. The survey was used to evaluate their learning styles and the reading passages were used to test their reading comprehension. Students' English second term examination scores were used as a covariate. Data resulting from the surveys were analyzed using ANCOVA and t-test.

The first research question states that: To what extent do reading methods affect Taiwanese 12th grade male students' reading comprehension. The results for differences in two reading methods on students' reading comprehension did not reach statistical significance. Therefore, when students' learning styles were unknown, there was no difference showing which reading method was better than the other.

The second research question states that: To what extent do learning styles relate to Taiwanese 12th grade male students' reading comprehension. When reading an easy

passage, the high auditory learners performed significantly better in the ORG than in the SRG. For the low visual learners, the oral reading was their better choice than the silent reading on the difficult reading passage. For other learning style preferences, the performance of reading comprehension in oral reading and silent reading would not be too much different. The findings of this research represent a new addition to the research base for the EFL learning. The findings also represent a new contribution to the knowledge base for reading methods and learning styles.

The implications for this research include the improvement of the learning style survey and the applications of the research results. This study created a high reliability survey instrument which can tell students' Visual and Auditory learning styles by asking only 6 questions for each learning style. This study presented the possibility of using students' learning style preference and reading methods to help EFL students have better reading comprehension. The implications also suggest that instructors and curriculum planners provide learning style test in EFL classroom and design more flexible teaching plans by using different reading methods. The learning style survey modified in this study provided good reliability by using 12 survey questions to test EFL students' Visual and Auditory learning styles. It is recommended that this research be expanded to include the addition of other ages, different first language populations, female participants, and

academic subjects to examine interaction between reading methods and learning styles.

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APPENDIXES

APPENDIX A

SURVEY QUESTIONS

LEARNING STYLE TEST

Part 1 Your Student ID number (座號) is _____

1. Please check the student ID number before you start answering survey questions.
2. Please circle the number which best describes your situation.
3. Please circle only one number per question.

For example:

The Sun rises in the East.

(Disagree) 1 --- 2 --- 3 --- ④ (Agree)

Learning Style Situations start hear:

1. I enjoy classes when I talk about my work.
   (Disagree) 1 --- 2 --- 3 --- 4 (Agree)

2. I find it easy to remember things that other people have told me.
   (Disagree) 1 --- 2 --- 3 --- 4 (Agree)

3. I am good at remembering people's faces, even if I haven't seen them for a while.
   (Disagree) 1 --- 2 --- 3 --- 4 (Agree)

4. I find it easy to remember stories that have been read to me.
   (Disagree) 1 --- 2 --- 3 --- 4 (Agree)

5. I find it easy to learn new things when they are shown with pictures.
   (Disagree) 1 --- 2 --- 3 --- 4 (Agree)

6. I find it easy to remember the words to music.
   (Disagree) 1 --- 2 --- 3 --- 4 (Agree)

7. When I am trying to spell a word, I find it easy to split the word into different sounds to help me spell it.
   (Disagree) 1 --- 2 --- 3 --- 4 (Agree)

8. When I am trying to remember something like a phone number, I sometimes make up a rhyme to help me remember it.
   (Disagree) 1 --- 2 --- 3 --- 4 (Agree)

9. When I am learning to spell a word, I try to remember what it looks like in my head.
(Disagree) 1 --- 2 --- 3 --- 4 (Agree)

10. When I look really closely at things, I often see things other people have missed.
(Disagree) 1 --- 2 --- 3 --- 4 (Agree)

11. I easily remember information when I see it on the blackboard.
(Disagree) 1 --- 2 --- 3 --- 4 (Agree)

12. I can understand things clearly when they are shown in graphs.
(Disagree) 1 --- 2 --- 3 --- 4 (Agree)

Part 2

1. Please make a check mark right before the answer which best describes your situation.
2. Please check only one response per question.

For example:

Did you go to school today?

___ Yes ___√___ No

Background Questions start hear:

13. What's your age?

___Under14 ___15 ___16 ___17 ___18 ___19 up

14. How many years have you been learning English?

___ 1 year ___ 2 years ___ 3 years ___ 4 years ___ 5 years ___ 6 years
___ 7 years ___ 8 years ___ 9 years ___ 10 years ___ 11 years ___ 12 years
___ 13 years ___ 14 years ___ 15 years ___ 16 years ___ 17 years ___ 18 years

15. Did you take a TOEFL test before?

___Yes ___No

16. Have you been living in Taiwan since your 6th birthday ?

___Yes ___No

If no, how many years have you lived in Taiwan _____

What other country have you lived in _____

17. Please check the languages you speak. (check as many as applies)

___Mandarin ___Taiwanese ___English ___Hakka ___Others_____

Thank you so much for you participation. ^_^

學習型態測試

第一部分　學習型態　　請填上你的座號 _____

1. 在填寫這份測驗表前請先填上您的座號
2. 請圈選最符合您狀況的號碼
3. 每題只圈選一個號碼

例子:

我昨天有來學校上課
(不同意)　1　---　2　---　3　---　④　(同意)

題目開始：

1. 我喜歡有課堂討論的課
(不同意)　1　---　2　---　3　---　4　(同意)

2. 我能很容易的記住其他人口頭上告訴我的事
(不同意)　1　---　2　---　3　---　4　(同意)

3. 即使很久沒見，我還是很能記住別人的臉
(不同意)　1　---　2　---　3　---　4　(同意)

4. 我很容易記得別人讀給我聽的故事
(不同意)　1　---　2　---　3　---　4　(同意)

5. 當新事物與圖片一起呈現時，我比較容易記得住
(不同意)　1　---　2　---　3　---　4　(同意)

6. 我容易記住歌詞
(不同意)　1　---　2　---　3　---　4　(同意)

7. 如果將一個英文字區隔成多個音節來記，我會更容易拼出這個英文字
(不同意)　1　---　2　---　3　---　4　(同意)

8. 當我試著記住一些事，例如記電話號碼時，我時常會使用口訣幫我記得它
(不同意)　1　---　2　---　3　---　4　(同意)

9. 我會試著去想英文字的樣子來幫助記憶這個英文單字
(不同意) 1 --- 2 --- 3 --- 4 (同意)

10. 當我用心觀察事物時能比其他人更能發覺一些細節
(不同意) 1 --- 2 --- 3 --- 4 (同意)

11. 黑板上寫下的字比上課聽見的句子，更容易讓人記住
(不同意) 1 --- 2 --- 3 --- 4 (同意)

12. 我容易記住以圖表方式表現的資訊
(不同意) 1 --- 2 --- 3 --- 4 (同意)

第二部分 Background Questions:

1. 請在最適合你狀況的答案前打勾
2. 每題請只勾選一個答案

例子:

你前天有來學校嗎?

___ 有 √ 沒有

題目開始:

13. 你現在幾歲?

___14歲以下 ___15 ___16 ___17 ___18 ___19歲以上

14. 你學了幾年英文?

___ 1 年 ___ 2 年 ___ 3 年 ___ 4 年 ___ 5 年 ___ 6 年
___ 7 年 ___ 8 年 ___ 9 年 ___ 10 年 ___ 11 年 ___ 12 年
___ 13 年 ___ 14 年 ___ 15 年 ___ 16 年 ___ 17 年 ___ 18 年

15. 你有考過托福嗎？

___有 ___沒有

16. 六歲之後，你一直長期住在台灣嗎？

___是 ___否 你在台灣住了幾年 _____
還住過哪些國家 _____

17. 請勾選你所有會講的語言

___國語 ___台語 ___英語 ___客家話 ___其他_____

Thank you so much for you participation. ^_^

APPENDIX B

TOEFL READING PASSAGES
(EASY& DIFFICULT)

The life of the sea otter, known to some people as a “floating teddy bear” and to scientists as Enhydra lutris, has not been easy, conservationist say. Their population off the California coast diminished from 18000 in 1800 to 1724 in 1988. In the 19th century, they were brought to the brink of extinction by American, Russian, and Spanish fur traders. But in 1938 a rancher spotted several of the small furry animals floating on their backs, their usual position, off the coast of California. Since then, their lumbers have slowly multiplied. The problem now is not that people hunt them for their furs but that the sea otters are at odds with the commercial shellfish industry. Many people in the shellfish industry want to get rid of the otters because they eat the very things that the industry wants: clams, abalone, lobster, crabs, and sea urchins. Another danger for the sea otter comes from the oil industry. Sea otters have no insulating layer of blubber to keep them warm in 50-degree waters. What keeps them warm is their long, thick fur. This fur must be kept fluffy and full of air bubbles in order to keep water from coming in direct contact with the otter's skin. If there is an oil spill, as has been common in recent years, the oil could mat the sea otter's fur, which would cause death by freezing within hours. As a result, conservationists are now concerned about what might happen if a large number of sea otters and an oil slick meet.

依據上面文章，將各題最適合的答案，填寫在下方空格中（單選題）：

1. Which of the following is the best title for this passage?
(A) Sea Otters: A Conservationist’s Concern
(B) Oil Slicks
(C) Sea Otters and Their Fur
(D) The Life of the Sea Otter

2. A sea otter is
(A) a furry animal
(B) a teddy bear
(C) a shellfish
(D) a sea bird

3. What happened to sea otters in the 19th century?
(A) The numbers of sea otters increased
(B) The shellfish industry caused the extinction of sea otters.
(C) Conservationists protected the sea otters.
(D) Sea otters were killed for their fur.

4. The word "spotted" in line 5 could best be substituted by which of the following?
(A) Shot (C) Saw
(B) Recorded (D) Caught

5. According to the passage, what protects sea otters from the cold?
(A) Extra fat
(B) Insulation
(C) Matted coats
(D) Fluffy fur

6. Which of these would be a problem for sea otters?
(A) Warm weather
(B) Tangled hair
(C) Bubbly water
(D) Shellfish

7. What major problem are the conservationists concerned about?
(A) Freezing weather
(B) An accident by the oil industry
(C) Oily skin
(D) Air bubbles coming in contact with the sea otter's skin

1.	2.	3.	4.

5.	6.	7.

Are the 80s and 90s the era of color? According to some people, they are. Now you can buy radios and electric fans in lavender and pink. Restaurants have an emphasis on flowers and colorful plates. Cars are coming out in pink and aqua. Even bathroom fixtures are being made in "honeydew" and "blond." Part of the importance of the color of an object is that the color affects the way one feels about it. You want a vacuum cleaner to look light and easy, which is why it may be colored in pastels and light colors. But gardening equipment and athletic equipment you want to look powerful. You would never find a lawn mower in pink, but red would be fine. Not very long ago, sheets were always white, and refrigerators commonly came in colors like "Old Gold," "Avocado Green," and "Coppertone." Now those are thought of as old-fashioned. Popular colors change, because fashion influences everything. In fact, new colors often spring from the fashion industry. It's a lot cheaper to make a blouse or skirt than a sofa. After people get used to seeing new colors on clothing or towels, they are ready to accept those colors in carpeting, refrigerators, or cars. Color-analysis consultants have been very successful in recent years. People want to choose the most flattering colors for makeup and clothing. Some car designers are even saying that people may begin buying cars of the color that goes with their skin coloring. This sounds too extreme. It's hard to believe that people are that impressionable.

依據上面文章，將各題最適合的答案，填寫在下方空格中（單選題）：

1. The best title for this passage is
   (A) Popular Colors
   (B) Color Consultants
   (C) The Success of Color
   (D) Flattering Colors

2. According to the passage, which of the following is not popular now?
   (A) "Coppertone"
   (B) Pastels
   (C) Colorful cars
   (D) Color consultants

3. According to the passage, why would red be a good color for a lawn mower?
   (A) Because it's strong
   (B) Because it's cheap
   (C) Because it's light
   (D) Because it's a pastel

4. How does the author probably feel about the topic of this passage?
   (A) Excited (C) Skeptical
   (B) Envious (D) Bored

5. In this passage, which of the following are NOT used as names for colors?
   (A) Hair color
   (B) Fruits
   (C) Minerals
   (D) Drinks

6. Why does the author say, “It’s cheaper to make a skirt than a sofa"?
   (A) As an illustration
   (B) As a reason
   (C) As a summary
   (D) As a definition

7. According to this passage, before people will buy expensive things in new colors, they must
   (A) be sure that the colors are popular
   (B) see if the color matches their skin color
   (C) talk to a color-analyst consultant
   (D) become familiar with the color on cheaper items

1.	2.	3.	4.

5.	6.	7.

APPENDIX C

THE WORDING DIFFERENCES BETWEEN THE SLACK AND NORWICH'S (2007) STUDY AND THE PRESENT STUDY FOR THE LEARNING STYLE SURVEY

The Wording Differences Between the Slack and Norwich's (2007) study and the Present Study for the Learning Style Survey

Note:
1. The upper sentences are the original questions from the Slack and Norwich's study and the lower ones are from the present study.
2. The major changes are underlined.

Visual Learning Style Questions:

- I am good at remembering people's faces, even if I haven't seen them for a while
- I am good at remembering people's faces, even if I haven't seen them for a while

- I find it easy to learn new things when they are shown in different coloured writing and with pictures
- I find it easy to learn new things when they are shown with pictures

- When I am learning to spell a word, I look closely at the word and try to remember what it looks like in my head
- When I am learning to spell a word, I try to remember what it looks like in my head

- I like looking really closely at things and often see things other people have missed
- When I look really closely at things, I often see things other people have missed

- I easily remember information when I see it on a video programme or on the overhead projector
- I easily remember information when I see it on the blackboard

- I can understand things clearly when they are shown in graphs
- I can understand things clearly when they are shown in graphs

Auditory Learning Style Questions:

- I enjoy lessons when we talk about our work and have discussions with partners or in groups
- I enjoy classes when I talk about my work

- I find it easy to remember things that other people have told me
- I find it easy to remember things that other people have told me

- I find it easy to remember stories that have been read to me
- I find it easy to remember stories that have been read to me

- I find it easy to remember the words to music
- I find it easy to remember the words to music

- When I am trying to spell a word, I find it easy to split the word into different sounds to help me spell it
- When I am trying to spell a word, I find it easy to split the word into different sounds to help me spell it

- When I am trying to remember something like a phone number, I sometimes make up a rhyme or tune to help me remember it
- When I am trying to remember something like a phone number, I sometimes make up a rhyme to help me remember it.

APPENDIX D

VALIDITY PANEL LIST
LETTERS TO VALIDITY PANEL
VALIDITY PANEL EVALUATION FORM

VALIDITY PANEL LIST

Researchers		
1	Dr. S	SLA professor, USA
2	Dr. R	SLA professor, USA
3	Dr. G	SLA professor, Taiwan
4	Dr. RC	Psychology professor, USA
5	Dr. Y	Statistics professor, USA
Teacher		
6	KI	High school English teacher, Taiwanese
7	KO	High school English teacher, Taiwanese
High School Students		
8	BC	High school student, male, EFL, Taiwanese
9	AY	High school student, male, EFL, Taiwanese
10	SL	High school student, male, EFL, Taiwanese

LETTERS TO VALIDITY PANEL

July 22, 2008

Dear Dr.____,

Thank you for consenting to serve as a member of the Validity Panel for my study. Finding experts in the field has not been an easy task. I am truly grateful to you for agreeing to share your expertise.

Enclosed please find the following:
(I) Brief description of the study and research questions
(2) Validity Panel Evaluation Forms attached to the instruments
(3) Survey questions
(4) Two TOEFL reading passages

Please use the Validity Panel Evaluation Forms to record your feedback. If you have additional comments, please use the back page of the form or attach another piece of paper. Your feedback will be extremely helpful to improve the validity of the instrument.

After you have completed your responses, please send the forms back to me in the enclosed envelope. If possible, I would like to have your feedback by September 3, 2008. Let me again express my profound gratitude for your taking precious time out of your busy schedule to assist me in my research endeavors.

Sincerely,

Yachi Teng

Validity Panel Evaluation Form

Name of Instrument: ***Learning Style Survey***
Estimated completion time: 10-15 minutes
Respondents: 12th grade Taiwanese EFL students

Please take a few minutes to examine the instrument and then respond to the following questions:

1. Is the length of the questionnaire reasonable for students to complete? ☐Yes ☐ No
If no, please suggest modifications.

_____

_____

_____

_____

2. Is the wording of the instruction accurate or clear? ☐Yes ☐ No
If no, please suggest modifications.

_____

_____

_____

_____

3. **Learning style questions** (Items #1-12)
Should anything/item(s) be added? ☐Yes ☐ No
If yes, please provide suggestions.

_____

_____

_____

_____

Should anything/item(s) be deleted? ☐Yes ☐ No
If yes, please indicate modifications.

_____

_____

_____

Are the wording understandable to EFL high school students? ☐Yes ☐ No
If no, please provide suggestions.

_____

_____

_____

_____

4. **Demographic information.**
Should any item(s) be deleted/added? ☐Yes ☐ No
If yes, please provide suggestions.

_____

_____

_____

_____

****

Name of Instrument: ***TOEFL reading passages***

Estimated completion time: Oral Reading Group 50 minutes
Silent Reading Group 35 minutes
Respondents: 12th grade Taiwanese EFL students

TOEFL Reading Passage A (The difficult one)
1. Is the length of the reading passage reasonable for students to complete? ☐Yes ☐ No
If no, please suggest modifications.

_____

_____

_____

_____

2. Is the difficulty of the reading passage reasonable for students to complete? ☐Yes ☐ No
If no, please suggest modifications.

_____

_____

_____

_____

3. Do the questions measure students' reading comprehension? ☐Yes ☐ No
If no, please suggest modifications.

_____

_____

_____

_____

TOEFL Reading Passage B (The easy one)
4. Is the length of the reading passage reasonable for students to complete? ☐Yes ☐ No
If no, please suggest modifications.

_____

_____

_____

_____

5. Is the difficulty of the reading passage reasonable for students to complete? ☐Yes ☐ No
If no, please suggest modifications.

_____

_____

_____

_____

6. Do the questions measure students' reading comprehension? ☐Yes ☐ No
If no, please suggest modifications.

_____

_____

_____

_____

7. Is the difficulty between the reading passage A and B easy to tell? ☐Yes ☐ No
If no, please suggest modifications.

_____

_____

_____

_____

APPENDIX E

PARENTAL CONSENT FORM

The parental Consent Form
University of San Francisco
Consent To Be A Research Subject

Purpose and Background

Yachi Teng, doctoral student in the Department of International and Multicultural Education, School of Education, at the University of San Francisco, is conducting a study on reading comprehension in the EFL (English as a Foreign Language) classroom. This study will investigate the relationship between learning styles and reading methods. My child is being asked to participate in this study because he is a 12th grade student in the Kaohsiung Municipal Kaohsiung Senior High School.

Procedures

If I agree to allow my child to be a subject in this study, the following will happen:

My child will finish a survey questionnaire and read two reading passages, which will take him about 2 hours.

Risks and/or Discomforts

1. My child is aware that emotional discomfort may arise when sharing personal and academic experiences of EFL learning in the survey; however he is free to decline to answer any questions or to stop his participation at any time.
2. My child's identity and that of his institution will be confidential. The researcher will only have his student ID number showed on both survey questionnaire and the answer sheets of two reading passages. The survey questionnaire and the answer sheets of two reading passages containing research information will be stored in a separate file where only the researcher can have access to data.

Benefits

The results of learning styles will be available to my child and me. My child can benefit from knowing his learning styles to conduct more appropriate learning plans.

Costs/Financial Considerations

There will be no financial costs to me or my child as a result of taking part in this study.

Payment/Reimbursement

Neither my child nor I will not be reimbursed for his participation in this study.

Questions

I have talked to Ms. Teng about this study and have had my questions answered. If I have further questions, comments, or concerns about this study, I may e-mail Yachi Teng at yteng@dons.usfca.edu or call her at 415-386-2392 or 886-7-2417187.

If I have any questions or comments about my participation in this study, I should first talk with the researcher. If for some reason I do not wish to do this, I may contact the University of San Francisco's Institutional Review Board for the Protection of Human Subjects, which is concerned with protection of volunteers in research projects. I may reach the IRBPHS office by calling (415) 422-6091 and leaving a voicemail message, by FAX at (415) 422-5528, by e-mailing IRBPHS@usfca.edu, or by writing to the: IRBPHS, Department of Counseling Psychology, Education Building, University of San Francisco, 2130 Fulton Street, San Francisco, CA 94117-1080.

Consent

I have been given a copy of the "Research Subjects' Bill of Rights," and I have been given a copy of this consent form to keep. PARTICIPATION IN RESEARCH IS VOLUNTARY. I am free to decline to have my child participate in this study or to withdraw my child from it at any point. My decision as to whether or not to have my child participate in this study will have no influence on my child's present or future status at the University of San Francisco.

My signature below indicates that I agree to allow my child to participate in this study.

Signature of Subject's Parent/Guardian	Date of Signature
Signature of Person Obtaining Consent	Date of Signature

APPENDIX F

STUDENT CONSENT FORM

Informed Consent Form
University of San Francisco
Consent To Be A Research Subject

Purpose and Background

Yachi Teng, doctoral student in the Department of International and Multicultural Education, School of Education, at the University of San Francisco, is conducting a study on reading comprehension in the EFL (English as a Foreign Language) classroom. This study will investigate the relationship between learning styles and reading methods. I am being asked to participate in this study because I am a 12th grade student in the Kaohsiung Municipal Kaohsiung Senior High School.

Procedures

If I agree to be a subject in this study, the following will happen:

I will finish a survey questionnaire and read two reading passages, which will take me about 2 hours.

Risks and/or Discomforts

1. I am aware that emotional discomfort may arise when sharing personal and academic experiences of EFL learning in the survey; however I am free to decline to answer any questions or to stop my participation at any time.
2. My identity and that of my institution will be confidential. The researcher will only have my student ID number showed on both survey questionnaire and the answer sheets of two reading passages. The survey questionnaire and the answer sheets of two reading passages containing research information will be stored in a separate file where only the researcher can have access to data.

Benefits

The results of learning styles will be available to me. I can benefit from knowing my learning styles to conduct more appropriate learning plans.

Costs/Financial Considerations

There will be no financial costs to me as a result of taking part in this study.

Payment/Reimbursement

I will not be reimbursed for my participation in this study.

Questions

I have talked to Ms. Teng about this study and have had my questions answered. If I have further questions, comments, or concerns about this study, I may e-mail Yachi Teng at yteng@dons.usfca.edu or call her at 415-386-2392 or 886-7-2417187.

If I have any questions or comments about my participation in this study, I should first talk with the researcher. If for some reason I do not wish to do this, I may contact the University of San Francisco's Institutional Review Board for the Protection of Human Subjects, which is concerned with protection of volunteers in research projects. I may reach the IRBPHS office by calling (415) 422-6091 and leaving a voicemail message, by FAX at (415) 422-5528, by e-mailing IRBPHS@usfca.edu, or by writing to the: IRBPHS, Department of Counseling Psychology, Education Building, University of San Francisco, 2130 Fulton Street, San Francisco, CA 94117-1080.

Consent

I have been given a copy of the "Research Subjects' Bill of Rights," and I have been given a copy of this consent form to keep. PARTICIPATION IN RESEARCH IS VOLUNTARY. I am free to decline to be in this study or to withdraw from it at any point. My decision as to whether or not to participate in this study will have no influence on my present or future status at the University of San Francisco.

My signature below indicates that I agree to participate in this study.

Participant's Signature	Date of Signature
Signature of Person Obtaining Consent	Date of Signature

APPENDIX G

IRB APPROVAL

Subject: IRB Application # 08-073 -Approved
Date: Thursday, September 11, 2008 1:24 PM
From: irbphs <irbphs@usfca.edu>
To: <yteng@usfca.edu>
Cc: Susan Roberta Katz <katz@usfca.edu>
Conversation: IRB Application # 08-073 -Approved

September 11, 2008

Dear Yachi Teng:

The Institutional Review Board for the Protection of Human Subjects (IRBPHS) at the University of San Francisco (USF) has reviewed your request for human subjects approval regarding your study.

Your application has been approved by the committee (IRBPHS #08-073). Please note the following:

1. Approval expires twelve (12) months from the dated noted above. At that time, if you are still in collecting data from human subjects, you must file a renewal application.

2. Any modifications to the research protocol or changes in instrumentation (including wording of items) must be communicated to the IRBPHS. Re-submission of an application may be required at that time.

3. Any adverse reactions or complications on the part of participants must be reported (in writing) to the IRBPHS within ten (10) working days.

If you have any questions, please contact the IRBPHS at (415) 422-6091.

On behalf of the IRBPHS committee, I wish you much success in your research.

Sincerely,

Terence Patterson, EdD, ABPP
Chair, Institutional Review Board for the Protection of Human Subjects
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IRBPHS – University of San Francisco
Counseling Psychology Department
Education Building - 017
2130 Fulton Street
San Francisco, CA 94117-1080
(415) 422-6091 (Message)
(415) 422-5528 (Fax)
irbphs@usfca.edu
