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Gender differences and reading proficiency in relation to learning styles of Chinese undergraduate EFL students

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Abstract

Students' learning styles may influence their language learning. The purpose of this study was to explore the distribution of first-year Chinese undergraduate EFL students' perceptual learning style preferences, and further identify whether their learning styles were impacted by gender and levels of English reading proficiency. Participants were 245 (170 females and 75 males) non-English major undergraduate students learning English as a foreign language (EFL). They were divided into high, moderate and low English reading proficiency groups according to their scores in an English reading comprehension test. Data were collected from a 30-item Perceptual Learning Style Preferences Questionnaire (PLSPQ) (Reid, 1984, 1995). The PLSPQ consists of six style modalities: Visual, Auditory, Kinesthetic, Tactile, Group and Individual. Descriptive statistical analyses showed that the participants' favored styles were Kinesthetic and Tactile, while Group style was the least favored. An independent Samples t-test indicated that male participants differed from female participants in Group style. One-Way ANOVA revealed that there was a significant difference in Group style between high English reading proficiency participants and low English reading proficiency participants. Discussions of the study's findings are presented. It is recommended that educators take learning styles into consideration when designing learning activities. Limitations of the study as well as recommendations for further research are presented.

***Keywords*:** *Perceptual learning style preferences, gender, English reading proficiency, EFL students, PLSPQ*

1. Introduction

English, as an international working language of communication, is playing an increasingly important role in many areas. In order to keep pace with the rapidly changing world, many people need to be able to read, i.e., comprehend, multiple forms of information that surround them. Especially in the case of university students, the ability to read is an essential component of academic success. Students may differ in many aspects, such as gender, age, personality, education background, learning proficiency, intelligence, aptitude, and attitude towards learning. It is interesting to note that individual EFL students behave very differently when engaged in the act of reading. For example, some would prefer reading for detail, others for general meaning; some are expert at reasoning, others are good at memorizing; some may pay attention to vocabulary, others may care for grammar. Individual differences, as the term suggests, are "characteristics or traits in respect of which individuals may be shown to differ from each other" (Dörnyei, 2005, p. 1) and which influence their understandings of written text. Koda (2005) provides a simple answer to the question as to why individual differences of readers should be studied, that is, "virtually all reading competencies are subject to variation" (Koda, 2005, p. 181). In her opinion, research on individual differences can yield useful theoretical and practical findings. Theoretically, readers' insights into basic reading competencies can determine their specific contributions to reading capability. And the knowledge of the constitution of successful reading and the distinction between good and poor readers enable researchers to refine some reading models. Pedagogically, research into individual differences can provide useful information for instruction where effective skills that are causally relevant to reading comprehension can be emphasized (Koda, 2005). Ellis (2008) divides L2 learners' individual differences into four categories based on their abilities, propensities, cognition concerning L2 learning, and learner actions. Each category is sub-

divided into one or several factors. For instance, intelligence, working memory, and language aptitude are factors categorized into abilities; while learning style, motivation, anxiety, personality, and willingness to communicate belong to the category of propensities, etc. (Ellis, 2008). Learning styles, as one of the factors of individual learner differences that may influence learning outcomes, have been used to label a variety of phenomena of interest to researchers.

Honigsfeld and Dunn (2003) summarized six characteristics that tend to differentiate among individuals' learning styles. These are gender, academic achievement, age, global versus analytic processing styles, creativity domains, and culture. Although a large body of research has been conducted among different cultural population to examine how gender and academic achievement influence learning styles, results of these studies differ. The present study thus takes an interest in investigating learning styles to examine the distribution of Chinese non-English major undergraduate EFL students' perceptual learning style preferences, and further identify whether their learning styles are impacted by gender and levels of English reading proficiency.

1.1 Learning styles and perceptual learning styles

Learners prefer to learn in ways that make them feel comfortable and/or that are easy for them to manage. Understanding learning styles can help learners and educators better achieve educational goals. Learning styles refer to "an individual's natural, habitual, and preferred way(s) of absorbing, processing, and retaining new information and skills" (Reid, 1995, p. viii). In the fields of psychology and language learning, a large number of theories, models, and measures of learning styles have been developed from different perspectives and considerations (e.g. Witkin's Field Dependence-Independence (FD/I) Model and Embedded Figures Test (EFT) Measure; Riding's Wholist-Analytic/Verbal-Imagery Model and Cognitive Styles Analysis (CSA) Measure; Kolb's Experiential Learning Model and Learning Style Inventory (LSI) Measure; Reid's Perceptual Learning Style Preference Questionnaire (PLSPQ)).

Perceptual learning styles refer to "the variations among learners in using one or more senses to understand, organize, and retain experience" (Reid, 1987, p. 89). Among the many styles theories and measures, the Perceptual Learning Style Preference Questionnaire (PLSPQ) developed by Reid (1995, originally developed in 1984) to measure learning styles of non-native speakers of English was the first learning styles inventory widely known in the L2 field (Dörnyei, 2005). The PLSPQ is a 30-item self-reporting questionnaire that measures learning style preferences from the perspective of six modalities: Visual, Auditory, Kinesthetic, Tactile, Group learning, and Individual learning. The first four constructs are considered as perceptual or sensory styles, while the last two belong to social styles. The characteristics of the six types of learners are described as: Visual learners learn well from seeing words in written forms. Auditory learners learn well from hearing words spoken. Kinesthetic learners learn best by being involved physically in experiences. Tactile learners learn best through "hands-on" work with materials. Group learners learn more easily when working together with others. Individual learners learn best when working alone (Reid, 1995). The 30-item five-point Likert scale PLSPQ assesses each of the six learning style constructs, i.e., Visual, Auditory, Kinesthetic, Tactile, Group, and Individual styles. Each style preference consists of five randomly distributed statements, each of which is given a numerical value of one to five in terms of the respondents' degree of agreement or disagreement (Strongly disagree = 1, Disagree = 2, Undecided = 3, Agree = 4, Strongly agree = 5). To help the respondents identify which style is their major learning style preference(s), minor learning style preference(s), and which learning style(s) is/are negligible, Reid (1995) classifies learning styles in her inventory as Major, Minor or Negligible. She set cut-off scores to distinguish between the three categories by suggesting that the numbers of the same style construct be added together to obtain a total score for that type, and then that, for convenience, it be multiplied by 2 to determine the Major, Minor or Negligible learning styles of each person. Cut-off scores falling between 38-50 are considered as Major learning style preference; 25-37, Minor learning style preference; and 0-24 are considered as Negligible. Major means the ways in which a learner learns best, Minor indicates areas that a learner can still function well, while Negligible means that s/he may have difficulty learning in that way.

No published research had reported the perceptual learning style preferences of non-native speakers before Reid's article was published (Reid, 1987). In order to provide baseline data for future research on the perceptual learning style preferences of non-native speakers, Reid (1987) used her PLSPQ to investigate 154 native English speakers and 1234 non-native speakers of English studying in the United States. She found that non-native speakers' learning style preferences often differed significantly from those of native speakers that most ESL students strongly preferred Kinesthetic and Tactile learning styles. Students of every language background responded to Group style (i.e., Group learners prefer to work in a group) as Minor or Negative preferences, with English speakers rating Group work lower than all other language groups. Moreover, none of the language groups showed a strong (Major) preference for Individual learning.

Since the PLSPQ was developed to address specifically ESL learners, it has been employed by many researchers to explore the perceptual learning styles of different cultural groups, e.g., Chinese (e.g., Chen, 2009), Iranian (e.g., Naserieh & Anani Sarab, 2013), Japanese (e.g., Hyland, 1993), Korean (e.g., Isemonger & Sheppard, 2003), Russian (e.g., Wintergerst & DeCapua, 2001), Thai (e.g., Khamkhien, 2012), etc. Researchers reported a diversity of preferred styles for their particular participants. And the inventory has been tested and modified by the researchers based on their own cultural contexts. For example, Wintergerst and co-workers reported on a series of studies of Reid's PLSPQ, and examined its reliability and validity. Wintergerst, DeCapua and Itzen (2001) discovered that the results of the PLSPQ and the oral interviews contradicted each other on several occasions. They put forward some speculations for this contradiction: underlying problems with the test construction, language problems of the participants, test-taking problems, statement design problems, culture-specific problems, or different language proficiency levels of native and non-native speakers of English. Peacock (2001) noted one problem with the PLSPQ: it does not give concrete examples of activities for each style and thus may lead to uncertainty about the categories. He thus modified and provided a clearer and more specific description of the activities of each category that he believed his Chinese EFL students at a Hong Kong university would perform in classes. He believed that his students probably associated the following activities with each style: Visual—reading teacher handouts; Auditory—listening to the teacher speak; Kinesthetic—role-play; Tactile—constructing something, e.g., taking notes; Group—discussion of a given topic in threes; Individual—working alone and silently on a textbook task (Peacock, 2001). It should be noted that Reid's explanations of the styles are from a general perspective, while what Peacock described are the characteristics of learning styles of a specific population that he had worked with.

It is also noteworthy that while no single inventory is perfect, the present study adopted Reid's (1995) PLSPQ as an instrument to investigate the Chinese EFL students' learning styles preferences. It was chosen for the following reasons: (1) PLSPQ was specifically developed for ESL students (Reid, 1987, 1990), including Chinese ESL learners. Thus, it is appropriate for the participants of this study who were all native Chinese speakers; (2) It was validated for non-native speakers by using the split-half statistical technique to determine which statements should remain within each style construct (Reid, 1987); (3) It has pre-established cut-off scores for Major, Minor, and Negligible learning style categories, which are clear for the respondents to identify their strongest and least preferred styles; (4) It has already been successfully piloted twice by Reid (1990); (5) A number of previous studies conducted in the Chinese context have also employed this framework (e.g., Chen, 2009; Hou, 2009; Melton, 1990). Adopting this framework thus allows comparisons of the findings of the present study with those of previous research; and (6) It is very convenient: neither long nor time-consuming to complete.

1.2 Gender differences in perceptual learning style preferences

Learning styles may vary according to individuals, but it is also possible that they may vary according to gender (Nel, 2008). The differences between males and females in learning styles have been examined in a variety of studies (e.g., Chen & Hung, 2015; Khatib & Ghosheh, 2013; Reid, 1987; Severiens & Ten Dam, 1994). Reid (1987) found that males preferred Visual and Tactile learning significantly more than females. Khatib and Ghosheh (2013) reported that there was

a significant difference between Arabic male and female students regarding Auditory learning style, Tactile learning style, and Group learning style in which male students favored Auditory and Tactile learning styles more than females and, on the other hand, female students favored Group learning style more than male students. Chen and Hung's (2015) investigation on ESP (English for Specific Purposes) university students in Taiwan showed that learning style preferences were impacted by gender that females preferred Group learning significantly more than males.

On the contrary, some researchers reported no significant differences between males and females. For example, Khamkhien's (2012) research showed no significant gender differences in Thai EFL learners' perceptual learning styles.

1.3 English reading proficiency levels in perceptual learning style preferences

In general, the level of reading proficiency refers to a person's ability to understand reading materials. A number of studies have examined the relationship between learning styles and academic performance in various disciplines. Reid (1987) claimed that the learning style preferences of ESL students with higher TOEFL scores more closely paralleled those of native English speakers. Bailey, Onwuegbuzie and Daley (2000) found that higher achievers in foreign language classes tend to like informal classroom designs and prefer not to receive information kinesthetically. Peacock (2001) asserted that Chinese students who favored Group styles were significantly less EFL proficient. Khatib and Ghosheh (2013) investigated three academic achievement groups of Arabic college students and found that there existed statistically significant differences between high and low achievers as well as between low and moderate achievers on Group learning style.

Most pioneer research on learning styles and reading achievement has focused on elementary school or middle school students in their L1 reading achievement. For example, based on her studies on youngsters, Carbo (1984) asserted that good readers preferred to learn through their visual and auditory senses. On the other hand, poor readers had less auditory and visual strength but stronger tactile and kinesthetic preferences. Williams (2010) examined the relationship between sensory learning style and U.S. seventh grade students' L1 reading comprehension levels, and the findings indicated that there was a relationship between Kinesthetic, Auditory, and Visual learning styles and reading comprehension levels, that the struggling reading group scored significantly lower in the Auditory learning style when compared to the on or above-grade-level group.

2. Method

2.1 Research questions

This study aimed to explore Chinese non-English major EFL undergraduate students' preferred learning styles, and further identify whether their learning styles were impacted by gender and levels of English reading proficiency. To this end, three research questions were addressed: 1) What is the distribution of the Chinese undergraduate EFL learners' preferred learning styles? 2) Are there any significant gender differences in the Chinese undergraduate EFL learners' perceptual learning styles? 3) Are there any significant differences in the Chinese undergraduate EFL learners' perceptual learning styles with regard to their level of English reading proficiency?

2.2 Participants

The participants of this study were 245 first-year non-English major EFL undergraduate students in their second semester of a four-year Chinese college degree in a university of finance and economics in China. They were divided according to two criteria: gender and levels of English reading proficiency. Their English reading proficiency levels were divided into low, moderate and high according to the results of an English reading comprehension test (RCT). The participants ranged from 17 to 22 years of age and had learned English for 7 to14 years. Table 1 shows a description of the participants' genders and levels of English reading proficiency. Among these 245 participants, 170 were female students (69.4%) and 75 were male students (30.6%). According to their scores in the RCT, 77 of them (31.4%) were considered as low English reading proficiency, 94 (38.4%) fell into the moderate English reading proficiency category, and 74 (30.2%) were grouped as high English reading proficiency.

Table 1 Participants' gender and English reading proficiency levels

		Level of English Reading proficiency			Total
		Low	Moderate	High	
Gender	Male	37	27	11	75
	Female	40	67	63	170
Total		77	94	74	245

2.3 Data collection instrument

The present study adopted Reid's (1995) Perceptual Learning Style Preference Questionnaire (PLSPQ) as an instrument to investigate the participants' learning style preferences in their study of English. The questionnaire booklet was organized in three parts. The first part was a background information section designed by the researcher to collect the participants' basic demographic information (i.e., student code, gender, age, major, and the number of years that they had studied English). In order to ensure compliance with ethical guidelines, and to guarantee informed consent, a question was attached to the second part by asking "Do you agree to respond to the questionnaire?" Participants were informed and guaranteed that the information for the questionnaire would be kept for research purposes only and would not influence their course examination results. All participants confirmed that they agreed to participate in the study; therefore, consent was obtained from all participants. The third part was the Chinese version of the PLSPQ. To ensure that the participants clearly understood the process, and to obtain content validity of the inventory, the PLSPQ was translated from English into Chinese by the researcher before being checked by two associate professors who were also doctoral degree holders in applied linguistics and who had taught English for more than ten years.

2.4 Data collection procedures

A pilot study with 48 students who did not belong to the main study was carried out before administration of the main study. Cronbach's Alpha reliability coefficient was used to examine the internal consistency of the items of the PLSPQ based on the scores of the pilot study. The result of Cronbach's Alpha (α) was 0.805, showing that the PLSPQ could be considered a reliable tool for the data collection part of the main study.

The questionnaire booklet was administered to 268 students for the main study. At the beginning of the questionnaire session, all participants were informed of the purpose and requirements of the survey and of the fact that there were neither right nor wrong answers, and were asked to express their honest opinions of each item. After discarding questionnaires with missing information or those where two choices had been made for one item, questionnaires from 245 students (91.4%) were considered as valid and used for statistical analysis (see Table 1).

2.5 Data analysis methods

The collected data in the main study were computer-processed and analyzed by SPSS version 20.0 software. Descriptive statistics were employed to analyze the overall profiles of the participants' performance on the learning styles, including means, standard deviations and frequencies. An Independent Samples t-test was run to calculate whether the participants' learning styles were significantly different in terms of their gender. One-way analysis of variance (One-Way ANOVA) was used to test whether the participants' learning styles differed significantly in regard to their reading proficiency levels, i.e., high, moderate and low.

3. Results and discussion

3.1 Results of descriptive statistics of the learning styles

In order to answer research question 1, namely, "What is the distribution of the Chinese undergraduate EFL learners' preferred learning styles?", descriptive results of the participant' scores in the PLSPQ were reported. Table 2 shows the descriptive statistics for the participants' scores and ranking on the six individual types of learning style preferences.

As Table 2 shows, the rankings of style preferences were as follows (in descending order): Kinesthetic (M = 3.6073, S.D. = .53), Tactile (M = 3.4922, S.D. = .60), Visual (M = 3.4351, S.D. = .39), Auditory (M = 3.4196, S.D. = .45), Individual (M = 3.3012, S.D. = .59), Group (M = 3.1551, S.D. = .66). The participants scored highest in the following four perceptual preferences: Kinesthetic, Tactile, Visual, and Auditory, whereas they scored lowest in the two

social preferences: Individual and Group. Among the perceptual preferences, Kinesthetic and Tactile styles were preferred over either Visual or Auditory, with Auditory styles ranking lowest of the four. In addition, all six constructs of learning styles fell into a Minor-use range, because all of the GSs (GS stands for Group Score, and is equal to the total of each item of a certain style group multiplied by 2 to compare with the cut-off scores of Major/Minor/Negligible styles) reach the cut-off range of 25-37 set for Minor style preference. Neither Major nor Negligible styles existed in the participants. The results indicate that, in general, students could still function well whatever their preferred learning styles, although no style preference could indicate which style enabled them to learn best, nor did they have difficulty in their ways of learning with any of them. Overall, among their Minor preferences, the two styles that they favored most were Kinesthetic and Tactile, while their least favored two were Individual and Group styles.

Table 2 Descriptive statistics for learning styles

	N	Min.	Max.	Mean	S.D.	Group Score	Group Level	Rank
Kinesthetic	245	2.20	5.00	3.6073	.53	36.07	Minor	1
Tactile	245	1.60	5.00	3.4922	.60	34.92	Minor	2
Visual	245	2.60	4.60	3.4351	.39	34.35	Minor	3
Auditory	245	2.00	5.00	3.4196	.45	34.20	Minor	4
Individual	245	1.60	5.00	3.3012	.59	33.01	Minor	5
Group	245	1.00	5.00	3.1551	.66	31.55	Minor	6

Note: *N = Number of participants; Min. = minimum; Max. = Maximum;*
S.D. = Standard Deviation; Group Score = Σ (Item of a certain style group) × 2 = Mean × 5 × 2

These findings were consistent with a number of studies which used the same measuring instrument, i.e., Reid's (1984) PLSPQ. A comparison with previous studies and the reasons for the results are discussed as follows:

The present study supports the finding of Reid's (1987) survey on non-native speakers in the United States, including Arabic, Spanish, Japanese, Malay, Chinese, Korean, Thai, and Indonesian students that, overall, non-native speakers had a strong preference for Kinesthetic and Tactile learning. In addition, the present study supports another claim by Reid (1987) that the majority of her subjects showed a negative preference for Group learning. Therefore, it seems one needs to agree that non-native speakers prefer Kinesthetic and Tactile learning, while disfavoring Group learning.

This study supports, to some extent, Rossi-Le's (1995) study conducted on 147 adult immigrants in ESL programs in two U.S. community colleges. She found that the majority of the students displayed a major learning style preference for the Tactile and Kinesthetic modalities. In the present study, although students did not display a major learning style preference, their first two favored styles were also Kinesthetic and Tactile.

This study also partially confirms Peacock's (2001) study carried out with 206 Chinese students taking EFL classes as part of their degree courses at the City University of Hong Kong. Peacock found that the most popular styles of his subjects were Kinesthetic and Auditory, while the least popular were Individual and Group, though neither was negligible. The commonalities between the present study and Peacock's (2001) are that Kinesthetic was the most favored preference, and social preferences, i.e., Individual and Group, were the least favored.

In addition, the non-existence of any Major learning style preference of the participants of this study parallels the finding of Lin and Shen's (1996) study that investigated Taiwanese junior college ESL students which found that no specific learning style was preferred by the Chinese ESL learners in Taiwan. They held that college students employed multiple learning styles in class and learners who were able to use multiple learning styles achieved greater success in class. Moreover, students' learning styles were flexible and they were able to adjust to their teachers' teaching styles intuitively. The tendency of no major learning style preferences in this study is also consistent with Hyland's (1993) investigation that Japanese students appeared to exhibit no specific major learning style but had multiple minor learning styles.

Price, Dunn and Sanders (1980) found that very young children were the most

tactile/kinesthetic, that there was a gradual development of visual strengths through the elementary grades, and that only in fifth or sixth grades can most young children learn and retain information through the auditory sense (cited in Reid, 1987). Carbo (1984) maintained that good readers preferred to learn through their visual and auditory senses. Price, Dunn and Sanders (1980) found that poor readers preferred to learn tactually and kinesthetically (cited in Carbo, 1984). As compared with Price, Dunn and Sanders (1980) and Carbo (1984), for the present study, due to their less English (reading) proficiency than a native English speaker's, it is reasonable to assume that the Chinese EFL students' preferences were just like native English-speaking children who favored tactile and kinesthetic learning where they preferred to learn by experiences such as participating in activities or learning through making something for a class project. Based on these previous studies, one could predict that when students achieve higher language proficiency, they might depend more on their visual and auditory senses to learn. In the early stages of reading, they would prefer kinesthetic and tactile styles but move to visual and auditory as their proficiency developed.

Another possible reason to explain why the Chinese students showed only Minor style preferences was probably related to cultural influence. Wintergerst and DeCapua (2001) pointed out that, on the PLSPQ, the Japanese students in Reid's (1987) study responded more moderately than all the other non-native English speaker groups. They noted a similar tendency in their Russian-speaking participants studying in the U.S. who rarely checked "strongly agree" or "strongly disagree" on the PLSPQ. Wintergerst and DeCapua (2001) attributed the tendency to strong cultural influence. Similar results were found in Stebbins' (1995) conclusion that neither Chinese nor Japanese students showed a strong preference for any style modality. Stebbins offered the explanation that perhaps Japanese as well as Chinese students are unwilling to express their opinions due to traditional cultural ideas. Chinese students are educated on the basis of traditional Confucian culture which emphasizes control and order instead of "acting out" (Stebbins, 1995, p. 112). Similarly, in the current study, Chinese students were also found to prefer choosing "agree" or "disagree", or mostly "undecided" rather than "strongly agree" or "strongly disagree". Due to the long-term influence of Chinese culture, which favors apparent modesty and mildness, in general, the Chinese students were conservative in responding to the inventory, avoiding the extremes. So, just as Wintergerst and DeCapua (2001) concluded that in cultures where extremes are not favored, students might not have clear Major learning style preferences. This does not mean that they do not have clearly defined preferences, only that they do not say so.

3.2 Results of t-test for gender differences in learning styles

In order to answer the second research question, i.e., "Are there any significant gender differences in the Chinese undergraduate EFL learners' perceptual learning styles?", the results of an Independent Samples t-test for the learning styles of male and female groups are reported below.

Table 3 T-test for gender differences in learning styles

	Gender	N	Mean	S.D.	*t*	Sig. (2-tailed)
Visual	Male	75	3.5040	.38	1.844	.066
	Female	170	3.4047	.39		
Tactile	Male	75	3.4853	.59	-.119	.905
	Female	170	3.4953	.61		
Auditory	Male	75	3.3787	.40	-.944	.346
	Female	170	3.4376	.47		
Group	Male	75	3.3200	.70	2.619	.009**
	Female	170	3.0824	.63		
Kinesthetic	Male	75	3.5627	.55	-.881	.379
	Female	170	3.6271	.52		
Individual	Male	75	3.3013	.63	.002	.998
	Female	170	3.3012	.59		

Note: *N = Number of participants; S.D. = Standard Deviation;*
t = t-test *value; **. Correlation is significant at the 0.01 level (2-tailed).*

The data from t-test in Table 3 show that female participants reported higher scores in Tactile, Auditory and Kinesthetic styles preferences than males, while male participants reported higher scores in Visual, Group and Individual styles preferences than females. Among the six constructs of learning styles, only Group style was found to have a significant difference in the distribution of learning style preferences between male (M = 3.3200, S.D. =.70) and female (M = 3.0824, S.D. = .63) participants (t = 2.619, p < .01). This reveals that compared with female participants, male participants tended to have Group style preference and the difference was significant. In other words, male students stated they would learn better by studying with at least one other student or working together with others than did female students.

A possible reason that accounts for this result might be that male students are more willing in general to work with others than their female counterparts. This may be because the participants in the present study were in their first year at college, and their learning behavior in secondary school might influence their learning habits in college. In secondary school, most of them would focus on study in order to pursue higher education instead of participating in group activities which might be very time-consuming. There are fewer group activities in secondary school than in college. In this situation, male students appeared to convert to collaboration more quickly than their female peers. In addition, all the participants in the current study were students in a university of finance and economics where students are encouraged to participate in multiple associations and collaborative activities to develop their communicative skills in order to meet the needs of their future work after graduation. According to the observation of the researcher, male students are more open or "bold" to these activities and are more willing to work in a group than female students who tend to show more shyness in some activities.

However, the finding that a significant difference existed only in Group style contradicted Khatib and Ghosheh's (2013) results which indicated that there was a significant difference between Arabic male and female students regarding Auditory learning style, Tactile learning style, and Group learning style in which male students favored Auditory and Tactile learning styles more than females. On the other hand, in their study, female students favored Group learning style more than male students.

3.3 Results of One-Way ANOVA for English reading proficiency differences in relation to learning styles

In an attempt to answer the third research question, "Are there any significant differences in the Chinese undergraduate EFL learners' perceptual learning styles with regard to their level of reading proficiency?", the results of One-Way ANOVA analyses for the three English reading proficiency groups with high, moderate and low in learning styles are reported.

As shown from Table 4, among the six learning style preferences, only the distribution of the Group style preference was found to have a significant difference between the participants' levels of English reading proficiency (F = 4.440, p < .05).

To further examine the differences between high, moderate and low English reading proficiency levels, a follow-up Multiple Comparisons Test using the Scheffé Post Hoc criterion for significance was performed. What is displayed in Table 5 is only the Group style preference, while the other five types of learning styles have been removed. Since there were no significant differences between the participants' levels of English reading proficiency in the distribution of the five styles, it was unnecessary to test which English reading proficiency groups were different from others in the five learning styles. In Table 5, the three English reading proficiency groups are listed separately in column (I), and the mean score of each was compared with that of the other two groups in column (J) respectively to see whether there were significant differences between them. It can be seen that there were significant differences between the low English reading proficiency and high English reading proficiency participants on the means of Group style preference at the 0.05 level of significance. The p-value was .019 (p < .05). The mean score for the low English reading proficiency participants (M = 3.3325, S.D. =.71) was significantly higher than that of the high English reading proficiency participants (M = 3.0297, S.D. = .67). This reveals that low English reading proficiency participants and high reading proficiency participants differed significantly in Group style preference, with the former tending to prefer Group styles.

Table 4 One-Way ANOVA for English reading proficiency differences in relation to learning styles

English Reading Proficiency		N	Mean	S.D.	F	Sig.
Visual	low	77	3.4338	.40	.025	.975
	moderate	94	3.4298	.40		
	high	74	3.4432	.37		
	Total	245	3.4351	.39		
Tactile	low	77	3.5195	.63	.524	.593
	moderate	94	3.5170	.56		
	high	74	3.4324	.63		
	Total	245	3.4922	.60		
Auditory	low	77	3.4727	.46	.797	.452
	moderate	94	3.3894	.43		
	high	74	3.4027	.47		
	Total	245	3.4196	.45		
Group	low	77	3.3325	.71	4.440	.013*
	moderate	94	3.1085	.59		
	high	74	3.0297	.67		
	Total	245	3.1551	.66		
Kinesthetic	low	77	3.5532	.53	.805	.448
	moderate	94	3.6085	.50		
	high	74	3.6622	.56		
	Total	245	3.6073	.53		
Individual	low	77	3.2519	.60	.409	.665
	moderate	94	3.3170	.58		
	high	74	3.3324	.59		
	Total	245	3.3012	.59		

Note: *N = Number of participants; S.D. = Standard Deviation;*
*F = F-value; *. Correlation is significant at the 0.05 level (2-tailed).*

Table 5 Multiple comparisons test for English reading proficiency differences in learning styles (Group style preference)

Dependent Variable	(I) English Reading Proficiency	(J) English Reading Proficiency	M.D.(I-J)	Std. Error	Sig.
Group	low	moderate	.22396	.10041	.085
		high	.30274*	.10635	.019*
	moderate	low	-.22396	.10041	.085
		high	.07878	.10152	.740
	high	low	-.30274*	.10635	.019*
		moderate	-.07878	.10152	.740

Note: *M.D. = Mean Difference; *. Correlation is significant at the 0.05 level (2-tailed).*

The finding that a significant difference existed between the low and the high English reading proficiency students on Group style preference lends support to Khatib and Ghosheh's (2013) investigation on Arabic college students that there was a significant difference between high and low achievers on Group learning style. The present study reveals that those who were low in English reading proficiency preferred working with others, possibly because they were weak in reading ability and could seek help from others or be more confident when working in a group. This finding supports Peacock's (2001) work that Chinese EFL learners who favored working in groups had significantly lower EFL proficiency.

4. Pedagogical implications, recommendations for further research and limitations

Instructional implications can be generated from the findings of this study. First, the knowledge of learning styles can help educators and trainers develop curricula and address individual learning needs (Khatib & Ghosheh, 2013). Carbo (1984) asserted that one of the most promising solutions to raising reading achievement levels is the use of learning style diagnosis and prescription in designing reading programs. Kinsella (1995) held it not only essential for teachers to have a practical understanding of learning styles, but also important for students to be aware of their own strengths and weaknesses in

learning. And the awareness of these is possible for students to develop a more versatile approach to learning in and out of classrooms. Rossi-Le (1995) suggested that language learners should be aware of their perceptual style dominance and their strategic approaches to learning, and that learners take the PLSPQ to get to know their strengths and weaknesses in learning so as to be able to reflect on their learning processes. Peacock (2001) argued that EFL teachers should teach in a balanced style in order to accommodate different learning styles. In addition, it is suggested that instructors understand their own teaching styles to develop flexible and varied approaches to instruction. Nel (2008) provided detailed suggestions for teachers in instructional planning and preparation that a variety of language learning tasks should be included so as to allow learners with different styles to do well. Materials should be sourced from a variety of areas, since different students with different interests may respond favorably to different stimuli.

Second, the findings of the present study shed light on the instruction of foreign language reading. According to Reid (1984), being involved physically in classroom experiences and actively participating in activities are suitable for kinesthetic learners. Therefore, in a reading class where most learners are kinesthetic, instructors can keep them actively involved by providing opportunities for them to practice, for example, assigning role-play tasks of what is (or is going to be) learned or asking them to put information on cards to assist understanding. Recent studies in EFL pronunciation development conducted in China confirm this (c.f. He & Sangarun, 2015; He, Sangarun, & Lian, 2015).

Third, from the findings of the present study, it is also suggested that instructors take into consideration gender differences and English reading proficiency levels when designing reading activities. For example, tasks designed for female students might provide more opportunities to participate in group work. In the same vein, low English reading proficiency students might be encouraged to join in collaborative activities with their high proficiency peers. Peacock (2001) suggested that teachers can reduce learner resistance to studying in groups by arranging group activities that are appropriate for them, explaining the rationale and benefits behind them, monitoring students as they work, and paying attention to feedback from groups after the activity.

Among the various theories, models and measures of learning styles, this study selected only a single learning style instrument to examine EFL learners' perceptual learning styles. According to Nel (2008), there is disagreement about the most effective instrument for measuring learning styles. Therefore, multiple instruments with high validity and reliability are recommended to be included for further research. Apart from that, the relatively small sample size might somewhat limit the findings of the present study and prevent generalization to other EFL groups in other contexts. A large scale investigation representing diverse populations is thus recommended for further research.

5. Conclusion

Despite these limitations, the present study offers insights into EFL students' learning styles preferences. The study explored the distribution of Chinese non-English major EFL undergraduate students' preferred learning styles, their gender differences and levels of English reading proficiency. Results from the current study indicate that all six constructs of learning styles fell into the category of a Minor-use range (as defined above). Neither Major nor Negligible style preferences existed among the participants. It was found that the mean scores of these students' perceptual/sensory preferences (Kinesthetic, Tactile, Visual, and Auditory) were higher than their mean scores for social preferences (Group and Individual). Overall, the dominant learning style preferences for the Chinese EFL students were Kinesthetic and Tactile, while the least favored were Individual and Group styles.

The present study showed that male students had a significantly higher preference for Group style than did female students. Other learning style constructs did not significantly differ by gender. That is to say, the male students claimed to learn better by studying with at least one other student or working in a group than did female students.

The present study also revealed that low English reading proficiency students and high English reading proficiency students differed significantly in Group style preference, with the former tending to prefer Group style to the latter.

In other words, those who had low English reading proficiency preferred working with others.

In summary, recognition of learning styles enables both learners and educators to understand how to learn and teach more effectively. Consciously asserting their strongly preferred learning styles and avoiding their disfavored styles, learners may lead them to perform better. However, it seems appropriate to encourage learners to broaden their range of style modalities so as to become more flexible and versatile and, thus, evolve the ability to adjust to a greater range of learning activities.

6. References

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