Ambiguity Tolerance and Perceptual Learning Styles of Chinese EFL Learners

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Abstract

Ambiguity tolerance and perceptual learning styles are the two influential elements showing individual differences in EFL learning. This research is intended to explore the relationship between Chinese EFL learners' ambiguity tolerance and their preferred perceptual learning styles. The findings include (1) the learners are sensitive to English ambiguities and are more reliable on the tactile and kinesthetic learning styles than on visual and auditory styles, (2) most Chinese EFL learners have more than one learning style preferences, (3) significant gender difference exists in ambiguity tolerance, but not in perceptual learning style preferences, and (4) the four perceptual learning styles are significantly correlated with ambiguity tolerance and the auditory learning style would exert more influence on ambiguity tolerance than the visual, tactile and kinesthetic learning styles.

Keywords: ambiguity tolerance; perceptual learning style; Chinese EFL learners

1. Introduction

Ambiguity tolerance and perceptual learning styles are the two crucial topics in studying individual differences associated with learning. Ambiguity tolerance is "a tendency to perceive or interpret information marked by vague, incomplete, fragmented, multiple, probable, unstructured, uncertain, inconsistent, contrary, contradictory, or unclear meanings as actual or potential sources of psychological discomfort or threat" (Norton, 1975). Perceptual learning styles mean that people learn by seeing, listening, touching and total physical involvement in learning environments (Vaseghi et al., 2012).

Ambiguity tolerance and one's preferred perceptual learning style both play an important role in the process of learning a second or foreign language. This research is intended to look into Chinese EFL learners' ambiguity tolerance and their major perceptual learning styles, and to explore the relationship between ambiguity tolerance and the four types of perceptual learning styles. For this purpose, this paper will answer the following two questions: (1) What is the relationship between Chinese EFL learners' ambiguity tolerance and perceptual learning styles? (2) Is there any significant gender difference in ambiguity tolerance and perceptual learning styles?

2. Literature Review

2.1 Ambiguity Tolerance

Ambiguity tolerance has been considered inseparable from language learning, especially second or foreign language learning. It is a significant predicator of one's second language acquisition (Chapelle & Roberts, 1986). A moderate level of ambiguity tolerance is conducive to EFL learners (Ely, 1986; Oxford & Ehrman, 1993).

Many researchers have labeled ambiguity tolerance as an ultimate and essential personality variable/trait (e.g. Budner, 1962; Ely, 1989; Dewaele & Li, 2013; Tayebinik & Puteh, 2013; Atamanova & Bogomaz, 2014). This personality may affect learners on many aspects, such as language proficiency, learning strategies and learners' class participation. Ambiguity tolerance will greatly influence students' listening comprehension (Zhou, 2000) and will help learners make progress in English communicative competence (Atamanova & Bogomaz, 2014). Kamran and Maftoon (2012) also verifies the positive relationship between ambiguity tolerance and reading comprehension. There are also researches (e.g. Ely, 1989; Chang, 2012; Chu et al., 2015) on the links between ambiguity tolerance and language learning strategies. According to Chang (2012), for example, there is a mediating effect of learning strategies between English proficiency and ambiguity tolerance.

Learners with different levels of ambiguity tolerance vary in some of their abilities. For instance, students who are more tolerant are more willing to take risks (Ely, 1986; Mclain, 1993; Oxford & Ehrman, 1993) or more independent (Arquero et al., 2015). A learner with a relatively higher level of ambiguity tolerance is more willing to be a multilingual speaker (Dewaele & Li, 2013).

Individual differences make teaching a worth-discussed topic. More tolerant students are more interested in getting participated in EFL online classes (Tayebinik & Puteh, 2013). Students of low ambiguity tolerance in language learning need more assistance and encouragement from the teachers (Yin, 2005; Chu et al., 2015). Teachers are suggested to take into consideration the students' ambiguity tolerance (Ely, 1989; Oxford & Ehrman, 1993; Chu et al., 2015) and other students' characteristics like learners' preferred learning styles (Oxford & Ehrman, 1993) when teaching in order to create a learner-friendly class environment.

2.2 Perceptual Learning Styles

Learning styles are one of the main contributors to individual differences (Ehrman et al., 2003). Learning styles would exert influence on many aspects, e.g. self-ratings and learners' academic achievements (Matthews, 1996). Russ (2012) proves the correlation between communication apprehension and learning style preferences.

Perceptual learning styles can be classified into visual, auditory, tactile and kinesthetic learning styles (Chen, 2009; Shen, 2010). There are many researches on the influence of perceptual learning style preference on second language learning (e.g. Bailey et al., 2000; Shen, 2010; Chen & Hung, 2012; Vaseghi et al., 2012; Kim & Kim, 2014); there are also researches of the VARK (visual, aural, reading/writing and kinesthetic) model (e.g. Wagner, 2004; Othman & Amiruddin, 2010). Thus thinking about learning styles in teaching becomes a must. Giving the learners the opportunity to learn in their preferred learning styles could facilitate their learning as much as possible (Ehrman et al., 2003). Teachers can orient their L2 instruction more effectively and plan out more useful teaching strategies as they know more about their students' style preferences (Vaseghi et al., 2012). Iurea et al. (2011) also concludes that participants have a greater satisfaction towards the teaching methods used in the courses which they consider are appropriate to their favorite learning styles in the educational process. So for a teacher, the mastery of the students' style preferences benefits not only students' learning but also the teacher's teaching. The students' attitude towards teaching might help the teacher to adjust or improve his teaching.

In teaching, figuring out individual differences, including the learners' style preferences and their needs has become a trend. Teachers should be sensitive to the students' requirement and creative in using different educational techniques in class for students of individual differences (Othman & Amiruddin, 2010). "Effective teaching requires flexibility, creativity and responsibility in order to provide an instructional environment able to respond to the learner's individual needs" (Tulbure, 2011).

Some researchers also highlight the importance of assessing learning style preferences. "Through style assessment we can help students recognize the power of understanding their language learning styles for making learning quicker, easier and more effective" (Oxford & Anderson, 1995). "Formal or informal assessments of students' preferred learning styles are extremely useful tools for understanding needs for options – for both the teacher and the learner" (Nuckles, 2000). According to Lee & Kim (2014), students who are aware of their identified learning styles will achieve better academic results. Thus it can be said that style assessment actually facilitates students' learning.

3. Research Design

3.1 Participants

A total of 190 EFL learners are selected to participate in this research. 9.48% of the participants are vocational college students or graduates from their vocational college, 86.84% are undergraduate students or graduates with a bachelor's degree and 3.68% are postgraduate students or students with higher educational degrees. All of them have learned English for at least nine years. 55.26% of the participants are English majors, and the rest 44.74% are non-English majors. The ratio of males to females is around 3: 4.

3.2 Instruments

Two questionnaires are answered by the participants: Ely's (1995) Second Language Tolerance of Ambiguity Scale (SLTAS) and the Reid's (1984) modified Perceptual Learning Style Preferences Questionnaire (PLSPQ). The SLTAS is designed to evaluate EFL learners' tolerance of ambiguity. There are 12 statements in total in this questionnaire and they are all associated with the ambiguities that an L2 leaner may encounter in his/her English learning, e.g., *When I'm reading something in English, I feel impatient when I don't totally understand the meaning*. The participants' responses are rated on four-point Likert scale, the scoring of which range from 4 indicating strongly agree to 1 indicating strongly disagree (*strongly agree=4, agree=3, disagree=2, and strongly*

disagree=1). The higher the score is, the less tolerant the respondent is in learning English.

The modified PLSPQ consists of 30 statements through which the v*isual, auditory, tactile, kinesthetic, group* and *individual* learning styles can be identified major, minor or negligible according to each participant's summed score. As this paper will mainly discuss the perceptual learning style preferences, the 10 items relevant to *group* and *individual* learning styles are omitted. So the second questionnaire has 20 items which contribute to distinguish the perceptual learning styles. The participants' responses are rated on five-point Likert scale, the scoring of which ranges from 5 indicating strongly agree to 1 indicating strongly disagree (*strongly agree=5, agree=4, undecided=3, disagree=2, and strongly disagree=1*).

3.3 Data Collection and Analysis

The two questionnaires used in this research are available online, and then the online links are also passed on to the participants. Also the two questionnaires are printed to send to some of the participants. Thus the data are collected in paper-and-pen and online forms. The data are analyzed with SPSS 17.0.

4. Findings

The statistical value of the Cronbach's Alpha analysis is respectively .861 and .821, indicating that the participants' levels of ambiguity tolerance and perceptual learning styles assessed by the two questionnaires are quite reliable.

4.1 Response Distribution of Ambiguity Tolerance

Table 1 shows the distribution of ambiguity tolerance of each response to each statement from the SLTAS.

Table 1. Response distribution of each statement

Statement	Strong disagree	Disagree	Agree	Strong agree
1	5	48	118	19
2	8	48	111	23
3	4	20	142	24
4	6	49	123	12
5	10	40	106	34
6	8	67	95	20
7	5	70	95	20
8	5	18	138	29
9	6	100	76	8
10	2	17	146	25
11	8	46	112	24
12	10	82	85	13
Average	6.4	50.4	112.3	20.9

It can be seen that the response *Agree* counts the most in almost all the statements, except Statements 9 (*It bothers me when the teacher uses an English word I don't know.*) and 12 (*One thing I don't like about reading in English is having to guess what the meaning is.*). In other words, over 50% of the participants cannot tolerate ambiguities in each specific learning context, with only being vexed at the unknown words used by teachers and guessing words' meaning during reading excluded.

Strongly disagree is the least popular response, only with an average of 3.38% which is even lower than that of *Strongly agree* (11.01%), indicating that in an exact learning context where ambiguity occurs, the number of the least tolerant learners is much higher than that of the most tolerant learners.

The above distribution also verifies the individual differences in second or foreign language learning. A higher score indicates a less tolerance. The descriptive statistics shows that the mean score (33.39) is higher than the midpoint (30), indicating that the participants on average are slightly less tolerant of ambiguity in learning English.

4.2 Distribution of Perceptual Learning Styles

Each of the four learning styles is linked to five of the 20 PLSPQ questions. Since the questionnaire is designed on a five-point Likert scale, the score for each learning style may range from the lowest 5 points to the highest 25 points. See Table 2.

Table 2. Descriptive statistics of visual, auditory, tactile and kinesthetic learning styles

	N	Min	Max	Mean	Std. Deviation	Variance
Visual	190	11	25	17.16	2.580	6.656
Auditory	190	11	25	17.62	2.306	5.316
Tactile	190	10	25	19.45	2.306	5.317
Kinesthetic	190	10	25	19.11	2.703	7.305

It can be seen that the mean scores of tactile and kinesthetic styles are higher than those of visual and auditory styles, indicating that the participants prefer tactile methods, with overall physical movement following, and they are least dependent on seeing when learning English.

4.3 Gender Distribution of Ambiguity Tolerance and Perceptual Learning Styles

The scoring results as to ambiguity tolerance and the four perceptual learning styles are classified into two groups according to the gender difference. See Table 3 and Table 4.

Table 3. Gender distribution of ambiguity tolerance

	Gender	N	Mean	Std. Deviation	Std. Error Mean
Score	Male	81	32.57	5.126	.570
	Female	109	34.01	4.756	.456

Table 4. Gender distribution of perceptual learning styles

	Gender	N	Mean	Std. Deviation	Std. Error Mean
Visual	Male	81	17.14	2.805	.312
	Female	109	17.18	2.412	.231
Auditory	Male	81	17.74	2.240	.249
	Female	109	17.53	2.359	.226
Tactile	Male	81	19.10	2.523	.280
	Female	109	19.71	2.105	.202
Kinesthetic	Male	81	18.96	2.861	.318
	Female	109	19.22	2.587	.248

Table 3 shows that there is a small difference between the mean of male (32.57) and female (34.01) ambiguity tolerances, and also a small disparity between their standard deviation. There are small differences between the means of male and female groups as to the perceptual learning styles shown in Table 4. For the visual, tactile and kinesthetic styles, the means of the female group (respectively 17.18, 19.71 and 19.22) are all greater than those of the male groups (respectively 17.14, 19.10 and 18.96), but the disparity is quite small. The result is reverse when it comes to the auditory style.

5. Discussion

5.1 On Levels of Foreign Language Ambiguity Tolerance

The results of SLTAS are discussed based on the four levels of second or foreign ambiguity tolerance, ranging from high level (12-24) to middle-high level (25-30), middle-low level (31-36) and high level (37-48). See Table 5.

Table 5. Descriptive statistics of distribution of ambiguity tolerance

	N	Min	Max	Mean	Std. Deviation	Variance
High	5	12	24	18.20	6.017	36.200
Middle-high	39	25	30	28.31	1.673	2.798
Middle-low	106	31	36	33.57	1.633	2.667
Low	40	37	48	39.80	2.785	7.754

Table 5 shows that the number of the participants who have high ambiguity tolerance only takes up less than 3%, and that of those with extremely low ambiguity tolerance accounts for 21%. The great majority of the respondents are at the middle level of ambiguity tolerance. The mean ambiguity tolerance score (33.39) shown in Table 2 is at the middle-low level of ambiguity tolerance, and it is nearly equivalent to the mean of the middle-low level of ambiguity tolerance (33.57). So the average participants fall in the middle-low level of ambiguity tolerance. This suggests that the Chinese EFL participants on average are much less tolerant of ambiguity when they learn English even though they have at least nine years' experience. Also the mean of male ambiguity tolerance (32.57) and that of female ambiguity tolerance (34.01) are both at the middle-low level. In addition, the mean score of the low level of ambiguity tolerance (39.8) is much lower than the midpoint of this scale (42.5). This means that the average participants who are very intolerant of ambiguity are at a relatively lower level.

5.2 On Perceptual Learning Styles

The perceptual learning style which scores the highest can be considered as one's most preferred perceptual learning style. See Table 6.

Table 6. The most preferred learning style

Preference	Visual	Auditory	Tactile	Kinesthetic
Participants (N)	32	41	111	98
Percentage	16.84	21.58	58.42	51.58

Table 6 shows that the participants are more dependent on the tactile and kinesthetic styles than on the visual and auditory styles. This is consistent with Table 2. There are only a small percentage of participants preferring to learn by seeing and listening. Each participant may have one or more major learning style preferences. Data show that the mean number of the major learning style preferences is 1.93. There are also some respondents who have all the four major learning style preferences and some others who have no major learning preference at all.

5.3 On Gender Difference

5.3.1 Gender Difference in Ambiguity Tolerance

An Independent Sample Test is taken to analyze whether there is any significant difference between the male group and the female group. See Table 7.

Table 7. Independent sample test on gender difference in ambiguity tolerance

		Levene's Test for Equality of Variances		T-test for Equality of Means		
		F	Sig.	t	df	Sig.(2-tailed)
AT	Equal variances assumed	.006	.936	-1.998	188	.047
	Equal variances not assumed			-1.976	165.064	.050

Levene's Test shows that the assumption of equal variances of the samples of the male ambiguity tolerance and the female ambiguity tolerance cannot be rejected (P = .936 > 0.05). T-test shows a negatively significant difference between the means of the male ambiguity tolerance and the female ambiguity tolerance (t = -1.998, P < 0.05). That is, gender difference exists as to ambiguity tolerance.

5.3.2 Gender Difference in Perceptual Learning Styles

Table 8 shows the analytical outcome of whether there exists any significant gender difference on the four perceptual learning styles.

Table 8. Independent sample test on gender difference in perceptual learning styles

	Levene's Test for Equality of Variances		T-test for Equality of Means		
	F	Sig.	t	df	Sig.(two-tailed)
Visual	.908	.342	-.126	188	.900
Auditory	.324	.570	.616	188	.539
Tactile	Equal variances assumed 2.565	.111	-1.807	188	.072
Kinesthetic	.514	.474	-.648	188	.518

First, the significance values of the four perceptual learning styles in the Levene's test are all larger than 0.05, which indicates that the hypothesis of equal variance should be accepted. Then the significance values of T-test based on equal variances are all larger than 0.05, which indicates that there is no significant difference between the means of the two gender groups. Therefore, there are no gender differences among the four perceptual learning styles.

5.4 Relationship between Ambiguity Tolerance and Perceptual Learning Styles

The results of Pearson correlation analyses are shown in Table 9.

Table 9. Correlation test on relationship between ambiguity tolerance and perceptual learning styles

		Visual	Auditory	Tactile	Kinesthetic
	Pearson Correlation	.172*	.226**	.169*	.158*
Score	Sig. (2-tailed)	.018	.002	.020	.030
	N	190	190	190	190

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

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

For visual learning style, the Pearson correlation coefficient (R_{visual}) is .172 and the corresponding significance value (P_{visual}) is .018. The correlation between ambiguity tolerance and visual learning style is significant at the 0.05 level. This indicates that the more intolerant of ambiguity a learner is, the more preferred they are to visual learning styles. And the value of R_{visual} (.172) indicates the weak correlation.

Likewise, ambiguity tolerance is significantly correlated with auditory learning style (R = .226, P = .002 < 0.01) at the 0.01 level and significantly correlated with tactile (R = .169, P = .02 < 0.05) and kinesthetic (R = .158, P = .03 < 0.05) learning style at the 0.05 level. Additionally, the correlation between auditory, tactile and kinesthetic styles and ambiguity tolerance is weak.

In conclusion, the Pearson correlation analysis reveals that ambiguity tolerance is positively correlated with the four perceptual learning styles, and all their mutual correlations are weak.

A Stepwise regression analysis is taken to determine whether the four perceptual learning styles have a distinctive forecasting function to ambiguity tolerance. See Table 10.

Table 10. A stepwise regression analysis

	Model Summary		ANOVA		Coefficients	
	R	R2	F	Sig.	t	Sig.
Auditory	.226	.051	10.136	.002	3.184	.002

As is shown in Table 10, only the independent variable, the auditory learning style, is involved in the regression equation prediction model, and in the model the value of R (R = .226) indicates that the auditory learning style is not strongly associated with ambiguity tolerance. But the significance value of F (F = 10.136, P = .002 < 0.05) means the regression equation has a significant fitting effect, and also the significance of regression coefficient (t = 3.184, P = .002 < 0.05) indicates that the auditory learning style will significantly influence ambiguity tolerance.

Therefore, it can be concluded that the auditory learning style influences ambiguity tolerance more than the other three learning styles even though all the four perceptual learning styles are significantly correlated with ambiguity tolerance. Auditory learning style has a positive predicting effect on ambiguity tolerance but the predictive power is not strong.

6. Conclusion

This research discussed the two important elements of individual differences in EFL learning, the Chinese experienced EFL learners' ambiguity tolerance and the four perceptual learning styles (visual, auditory, tactile and kinesthetic learning styles). The result shows that the experienced Chinese EFL learners are quite sensitive to ambiguity tolerance and are more reliable on the tactile and kinesthetic learning styles than on visual and auditory styles. Over half of the Chinese EFL learners have more than one major learning style preferences. Significant gender difference does exist in ambiguity tolerance. However, there is no significant difference between male and female learners in perceptual learning style preferences. It is also found that the four perceptual learning styles are significantly correlated with ambiguity tolerance and that the auditory learning style would exert more influence on ambiguity tolerance than the visual, tactile and kinesthetic learning styles. This research suggests that the Chinese EFL learners need to raise their awareness of learning style preferences, and then they could know how to learn better on their own conditions. This research provides a theoretical basis for the English teachers and the students to combine the two influential elements in their teaching or learning practices. Whether or to what extent it applies will be further examined in classroom activities.

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Appendix A

Second Language Tolerance of Ambiguity Scale (Christopher M. Ely)

1. When I'm reading something in English, I feel impatient when I don't totally understand the meaning.

2. It bothers me that I don't understand everything the teacher says in English.

3. When I write English compositions, I don't like it when I can't express my ideas exactly.

4. It is frustrating that sometimes I don't understand completely some English grammar.

5. I don't like the feeling that my English pronunciation is not quite correct.

6. I don't enjoy reading something in English that takes a while to figure out completely.

7. It bothers me that even though I study English grammar, some of it is hard to use in speaking and writing.

8. When I'm writing in English, I don't like the fact that I can't say exactly what I want.

9. It bothers me when the teacher uses an English word I don't know.

10. When I'm speaking in English, I feel uncomfortable if I can't communicate my idea clearly.

11. I don't like the fact that sometimes I can't find English words that mean the same as some words in my own language.

12. One thing I don't like about reading in English is having to guess what the meaning is.

Appendix B

Perceptual Learning Style Preference Questionnaire (Joy Ried)

1. When the teacher tells me the instructions I understand better. (Auditory)

2. I prefer to learn by doing something in class. (Kinesthetic)

3. I learn better by reading what the teacher writes on the blackboard. (Visual)

4. When someone tells me how to do something in class, I learn it better. (Auditory)

5. When I do things in class, I learn better. (Kinesthetic)

6. I remember things I have heard in class better than things I have read. (Auditory)

7. When I read instructions, I remember them better. (Visual)

8. I learn more when I can make a model of something. (Tactile)

9. I understand better when I read instructions. (Visual)

10. I learn more when I make something for a class project. (Tactile)

11. I enjoy learning in class by doing experiments. (Kinesthetic)

12. I learn better when I make drawings as I study. (Tactile)

13. I learn better in class when the teacher gives a lecture. (Auditory)

14. I understand things better in class when I participate in role-playing. (Kinesthetic)

15. I learn better in class when I listen to someone. (Auditory)

16. When I build something, I remember what I have learned better. (Tactile)

17. I learn better by reading than by listening to someone. (Visual)

18. I enjoy making something for a class project. (Tactile)

19. I learn best in class when I can participate in related activities. (Kinesthetic)

20. I learn more by reading textbooks than by listening to lectures. (Visual)

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