

Exploring the Linguistic Landscape of a Historical and Cultural City in China: From the Perspective of Language Ecology

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Abstract—In recent years, “linguistic landscape” has gradually become a hot research topic in the field of sociolinguistics. Compared with the current research situation abroad, the focus of the research in China is still on basic concepts, theoretical frameworks, research methods, and research reviews, with insufficient case studies and relatively narrow research perspectives. This study selects several typical places in Shaoxing, a national historical and cultural city in China, as the research sites. With the quantitative and qualitative research methods, this study investigates the current situation of linguistic landscape, including language use, physical characteristics, cultural and historical elements, translation of texts on bilingual and multilingual signs, multimodal signs, and attitudes and perceptions, and examines the interactions between linguistic landscape and its environment. The study concludes that the linguistic landscape in the city is well constructed with distinctive historical and cultural characteristics and is in harmony with the environment except for a few ecological problems. And it suggests that more researchers pay attention to the protection, inheritance and development of linguistic landscape, and experts and scholars from a wider range of fields jointly conduct research on LL with Chinese characteristics, and finally accelerate the process of globalization and internationalization in China.

Index Terms—linguistic landscape, a historical and cultural city, language ecology

I. INTRODUCTION

In the 1970s, Haugen put forward the concept of “language ecology”, which is defined as “the study of the interactions between any given language and its environment” (Haugen, 1972, p. 57). It is known as “Haugen model” in the study of language and ecology, a metaphorical research model that makes an analogy between the language environment and the natural environment. While the study of natural ecology focuses on the interactions between the various components in the ecosystem, the study of language ecology pays attention to the interactions between language and its geographical, ethnic, social, cultural, historical, and other factors. The focuses of the study of language ecology are language survival and development, language diversity, language standardization, endangered language protection, language vitality, language planning, etc., which are closely related to social development and cultural inheritance. Nowadays, social development and frequent human activities have led to the destruction of the natural environment on which human beings depend, and ecological issues have gradually become a hot topic. The 19th National Congress of the Communist Party of China proposed that the construction of ecological civilization is the millennium plan for the sustainable development of the Chinese nation, and language ecology is also an important part of the construction of ecological civilization. The language ecology of a city is inseparable from its construction and development. A harmonious language ecology can create pleasant environment, help the city’s construction of spiritual civilization, enhance its image, attract more foreign talents and investments, and further promote its development.

The most classic and widely quoted definition of “linguistic landscape” (LL hereafter) is “the language of public signs, advertising billboards, street names, place names, commercial shop signs, and public signs on government buildings” (Landry & Bourhis, 1997, p. 25), which combines to form “the linguistic landscape of a given territory, region, or urban agglomeration” (Landry & Bourhis, 1997, p. 25). Thus, LL refers to any language signs that can be seen in the real world and is an important component of language ecology. The study of LL is a fine method for studying an important aspect of the sociolinguistic ecology of a city (Spolsky, 2008). In addition, the LL of a city has a direct impact on people’s lives, visualizes the city image, and presents the city’s landscape and cultural heritage. And it has a pivotal impact on the shaping of the city image and plays an important role in the construction of language ecology of a city.

II. LITERATURE REVIEW

In recent years, LL has gradually become a hot research topic in the field of sociolinguistics. With the development of society and the deepening of research, the scope of research subjects has been further expanded. LL not only refers to “the language of public signs” but also “words appeared or displayed in changing public spaces” (Shohamy & Waksman, 2009, p. 314). It includes a wider range of language signs on posters, graffiti, slogans, electronic display

boards, advertisements on buses, etc. Furthermore, according to the latest research, non-linguistic symbols such as images, sounds, music, colors, smells, etc. are also considered as the research subjects of LL.

It is believed that research on LL abroad has roughly gone through three stages: the first stage before 1997, the second stage from 1997 to 2007, and the third stage after 2008 (Xu, 2017). In the first stage, the concept of LL has not yet been put forward, and the study of LL is regarded as one branch of language study. However, some scholars have paid attention to the LL in some regions or big cities to study the local language use. For example, Rosenbaum et al. (1977) studied the language characteristics of street signs in Jerusalem. Tulp (1978) investigated the language use of billboards in Brussels, Belgium. And Monnier (1989) found that laws in Quebec, Canada had exerted a great influence on language signs in public spaces. In the second stage, the concept and functions of LL are formally proposed (Landry & Bourhis, 1997), and a theoretical analysis framework is formed. Scollon and Scollon (2003) proposed the theoretical method of “geosemiotics”, which has received great attention. In addition, Gorter (2006) published a collection of theses *Language Landscape: A New Approach to Multilingualism* and Backhaus (2007) published the book *Linguistic Landscapes: A Comparative Study of Urban Multilingualism in Tokyo*, both of which have contributed to the study of LL. In the third stage, LL has been integrated with many disciplines such as geography, sociology, political science, education, economics, etc., forming an interdisciplinary research trend. And a research academic community has gradually formed, and specialized academic conferences and journals, such as *Linguistic Landscape: An International Journal* launched in 2015, have appeared. All these demonstrate the characteristics of scale, organization and systematization of the study of LL. Multilingualism, the globalization of English, language policy, language awareness, etc. are the main perspectives of the study. And the research sites have gradually shifted from small urban places, such as city streets and ethnic minority areas, to relatively large geographical areas.

In contrast, the study of LL begins relatively late in China, and hasn't received enough attention. It is until 2014 that a relatively stable development has been seen (Fu & Bai, 2020), with an introduction to research perspective, theoretical construction, and research methods (Shang & Zhao, 2014). And initial progress has been made in empirical research since 2017. Compared with the research abroad, there is greater possibility of further research in China. Firstly, the case studies of LL are relatively insufficient with confined research sites. As the study of LL has traditionally focused on multilingualism, most case studies have been carried out in multilingual areas, including some large cities and ethnic minority areas. But in the past several years, there have been a small number of LL studies conducted in cities or regions with cultural characteristics (Sheng, 2019; Sheng & Zhang, 2020; Jin, 2020), and some achievements have been made. Therefore, it is essential to carry out more microscopic and solid case studies in broader and specific contexts (Zhang, 2020) to examine the characteristics of language landscapes in more geographical areas and explore the social phenomena behind the language. Secondly, the theoretical construction of research on LL is weak, with relatively narrow research perspectives. There are rich research theories abroad, including “geosemiotics” (Scollon & Scollon, 2003), SPEAKING model (Huebner, 2009), “language choice theory” (Spolsky, 2008), and “four structuration principles” based on sociological theory (Ben-Rafael, 2008), etc. However, since research theories have not yet been established in China, researchers have to carry out local analysis on the basis of those theories abroad. In addition, for there are two functions attached to the LL of a given territory: an informational function and a symbolic function (Landry & Bourhis, 1997), the study of LL should not be limited to the study of language use on the signs. The research perspectives should be extended to the issues such as status, language policy, cultural identity, and ideology behind the language. However, the studies in China have been mostly carried out from the perspective of translation, and there is a lack of in-depth research on symbolic functions.

This case study was carried out in Shaoxing, Zhejiang Province, China, which has a history of more than 2,500 years. Shaoxing was listed as one of the national historical and cultural cities in 1982 and awarded “Culture City of East Asia” in 2021. Instead of being in a large city or a minority area, the research sites are located in an ancient city with a long history. Therefore, in addition to examining the language use, more attention will be paid to the interactions between the LL and the environment in the city.

III. METHODOLOGY

A. Research Questions

This study attempts to conduct a case study on the LL of Shaoxing, a historical and cultural city in China, from the perspective of linguistic ecology under the guidance of LL theories. And research questions are as follows: (1) What is the current situation of the LL in the city? (2) How is local language ecology reflected by the interactions between the LL and the environment in the city?

B. Research Instruments

Both quantitative and qualitative approaches were employed in this study. Firstly, photographs of the language signs at the research sites were taken with mobile phones or digital cameras. The LL in this study is limited to linguistic symbols, and non-linguistic symbols are not included. Then the photographs were sorted and classified according to Backhaus' classification system in his Tokyo research, that is, an individual sign containing “any piece of text within a spatially definable frame” (Backhaus, 2007, p. 66) is considered one unit of analysis. And the signs with the same language or different languages but the same content are taken as one unit. Based on this, a total of 762 units of analysis

were collected, including road signs, information signs, warning signs, shop signs, posters, etc. After the collection, the frequency and proportion of each type of sign were counted. Secondly, qualitative approach was used by interviewing tourists to understand their attitudes and perceptions towards the LL at the research sites. In order to ensure that the interviewees could have more comprehensive and objective comments on the LL at the research case sites, the author led a student research team, who were conducting an investigation on the LL of Shaoxing ancient towns under the supervision of the author, to visit all the sites. The team, consisting of 10 members, all come from other regions rather than Shaoxing, so they can be identified as tourists. All students had interviews with the author after the visit. Each interview lasted about 5-10 minutes and was recorded by the author.

C. Research Sites

Shaoxing, a prefecture-level city in Zhejiang Province, is located in the central and northern part of Zhejiang Province, East China, with Ningbo in the east and Hangzhou in the west. As a cultural and ecological tourism city with the characteristics of Jiangnan (south of the Yangtze River) town in China, it is also famous as a city of water, bridge, wine, calligraphy, and celebrities. In this famous ancient city, a large number of cultural relics and former residences of famous people are preserved. Shaoxing also owns splendid “Yue culture”, including the culture of water control, yellow wine, opera, bridge, and Tang poetry. Therefore, it is renowned as a “museum without walls”. In this study, several typical places considered to be the most famous and most frequented by visitors are selected as the research sites. They are The Native Place of Lu Xun, Shen’s Garden, Bazi Bridge, The Calligraphy Sage Historic Site, Former Residence of Zhou Enlai, and Cangqiao Historical Street (for a brief introduction, see Table 1), as well as the two busiest main streets in the central district, JIEFANG BEILU and ZHONGXING ZHONGLU. The LL at these research sites is typical and representative and, to some extent, could reflect the current situation of local LL and language ecology.

TABLE 1
A BRIEF INTRODUCTION TO THE SCENIC SPOTS

Name of the place	Brief introduction
The Native Place of Lu Xun	a place where Lu Xun, the famous writer and thinker, was born and lived in his youth, including several cultural monuments such as Former Residence of Lu Xun, Baicao Garden, Sanwei (Three-flavor) Study, Ancestral Residence of Lu Xun, Tugu (Village God) Temple, Changqing Temple, Garden of Folk Customs in Lu Xun’s Works, and The Memorial Hall of Lu Xun.
Shen’s Garden	a famous private garden in Shaoxing during the Southern Song Dynasty, famous for Lu You’s poem “Phoenix Hairpin”.
Bazi Bridge	a bridge known as the “overpass” in ancient China, which reflects the mature bridge-building technology in the Southern Song Dynasty.
The Calligraphy Sage Historic Site	the former residence of the famous scholars in Shaoxing: Wang Xizhi and Cai Yuanpei
Former Residence of Zhou Enlai	a place where Zhou Enlai, one of the founders of the People’s Republic of China, and his family were lived, typical of the architectural style in the Ming and Qing Dynasties.
Cangqiao Historical Street	a historical and cultural street with the features of the ancient city, which wins UNESCO Asia-Pacific Heritage Conservation Award of Merit Citation.

IV. RESULTS

Based on “geosemiotics” of Scollon & Scollon and “three dimensions of space framework” of Trumper-Hecht (2010), together with several elements that need to be paid attention to in the study of LL in China, the research framework of this paper is formed. Therefore, the elements to be examined in this paper include language use, physical characteristics, cultural and historical elements, translation of texts on bilingual and multilingual signs, multimodal signs, and attitudes and perceptions.

A. Language Use

(a). Number of Language Codes on Signs

The investigation showed that there were five language codes on the 762 signs. They were Chinese, English, Korean, Japanese, and Tibetan. According to the number of language codes on the signs, they were classified and counted as monolingual, bilingual and multilingual signs. Pinyin, as a tool to help with the pronunciation of Chinese characters, could also be found on the signs. Since Pinyin was inseparable from Chinese, Pinyin and Chinese were classified as one language code. And the results were given in Table 2. The proportion of monolingual signs in either Chinese or English was 65.8%, that is, approximately two-thirds of the signs were monolingual. Bilingual signs existed, but the proportion was not high. Some of them could be found on the road signs. And multilingual signs could only be found in some scenic spots, including S1, S2 and S5, accounting for more than 40%.

TABLE 2
NUMBER OF LANGUAGE CODES ON SIGNS (PLACE)¹

Place	Monolingual signs (N)	Monolingual signs (%)	Bilingual signs (N)	Bilingual signs (%)	Multilingual signs (N)	Multilingual signs (%)
S1	42	35.3	29	24.4	48	40.3
S2	37	39.4	11	11.7	46	48.9
S3	24	80.0	6	20.0	0	0
S4	57	73.1	9	11.5	12	15.4
S5	18	42.8	7	16.7	17	40.5
S6	128	91.4	12	8.1	0	0
R1	90	75.0	30	25.0	0	0
R2	105	75.5	34	24.5	0	0
Sum	501	65.8	138	18.1	123	16.1

Drawing on Ben-Rafael et al.'s (2006) dichotomy, LL can be identified into two broad categories: top-down signs and bottom-up signs. The dichotomy can help to facilitate our understanding of the language choices of different producers on signs. Top-down signs generally include road signs, notice signs, and name signs of places and institutions and they are produced by governments at all levels or local organizations. And bottom-up signs are mainly created by companies or individuals, including shop signs, advertising signs, etc. If the collected language signs were classified and counted according to this standard, we could get the results in Table 3. While 85.9% of bottom-up signs were monolingual, multilingualism signs could only be found in top-down signs, accounting for 32.6%. In addition, bilingualism and multilingualism were more common on top-down signs than on bottom-up ones.

TABLE 3
NUMBER OF LANGUAGE CODES ON SIGNS (TYPE)

Type	Monolingual signs (N)	Monolingual signs (%)	Bilingual signs (N)	Bilingual signs (%)	Multilingual signs (N)	Multilingual signs (%)
Top-down	171	45.2%	84	22.2%	123	32.6%
Bottom-up	330	85.9%	54	14.1%	0	0%
Sum	501	65.8%	138	18.1%	123	16.1%

(b). *Distribution of Language Codes on Signs*

The combination mode of language on the signs presents the distribution of language codes. According to the results of the investigation, there were three modes. The monolingual mode referred to the one that Chinese characters (Chinese characters + Pinyin) or English was the only language code on the signs, while the bilingual mode included the one with the combination of Chinese characters and English, or Chinese characters and Tibetan. And there was only one multilingual mode, namely, "Chinese characters + English + Korean + Japanese". The language signs collected at the research sites were counted and calculated, and the results were shown in Table 4. The most common mode was "Chinese characters only", with a total number of 475 signs, accounting for 62.3%. The number of "Chinese characters + English" bilingual mode is close to that of the "Chinese characters + English + Korean + Japanese" multilingual mode. In addition, the bilingual mode could mainly be found on streets, while the multilingual pattern could mostly be seen in several scenic spots.

TABLE 4
DISTRIBUTION OF LANGUAGE CODES ON SIGNS (PLACE)

Place	Chinese characters only	Chinese characters Pinyin	+	English only	Chinese characters English	+	Chinese characters Tibetan	+	Chinese characters + English + Korean + Japanese
S1	40	1		1	28		1		48
S2	37	0		0	11		0		46
S3	21	3		0	5		1		0
S4	55	1		1	9		0		12
S5	18	0		0	7		0		17
S6	120	7		1	12		0		0
R1	84	4		2	30		0		0
R2	100	3		2	34		0		0
Sum	475	19		7	136		2		123

If the collected language signs were classified as top-down and bottom-up ones, we could get the results in Table 5. There are four combination modes on the top-down signs, namely, "Chinese characters only" (N=157), "Chinese characters + Pinyin" (N=14), "Chinese characters + English + Korean + Japanese" (N=123) and "Chinese characters + English" (N=84). And "Chinese characters only" was the prominent mode on the bottom-up signs.

¹ As for names of the places, "S" is short for "Scenic spot" and "R" for "Road". S1: The Native Place of Lu Xun, S2: Shen's Garden, S3: Bazi Bridge, S4: The Calligraphy Sage Historic Site, S5: Former Residence of Zhou Enlai, S6: Cangqiao Historical Street, R1: JIEFANG BEILU, R2: ZHONGXING ZHONGLU.

TABLE 5
DISTRIBUTION OF LANGUAGE CODES ON SIGNS (TYPE)

Type	Chinese characters only	Chinese characters + Pinyin	English only	Chinese characters + English	Chinese characters + Tibetan	Chinese characters + English + Korean + Japanese
Top-down	157	14	0	84	0	123
Bottom-up	318	5	7	52	2	0
Sum	475	19	7	136	2	123

(c). Code Preference

The language codes are arranged in some sequence on the bilingual and multilingual signs, and the code in the dominant position is called preferred code. It may also have the most striking color. The results were given in Table 6 after the language signs collected at the research sites were counted and calculated. Though there were 261 bilingual or multilingual signs among 762 language signs, only two preferred codes, Chinese and English, were found. While Chinese was the preferred language code in most cases, English appeared sporadically.

TABLE 6
PREFERRED CODE ON SIGNS (PLACE)

Place	Chinese	English
S1	75	2
S2	57	0
S3	6	0
S4	20	1
S5	24	0
S6	11	1
R1	25	5
R2	27	7
Sum	245	16

If the collected language signs were classified as top-down and bottom-up ones, we could get the results in Table 7. It showed that the preferred code on all the top-down signs was Chinese, and all the signs with English as the preferred code belonged to the bottom-up signs.

TABLE 7
PREFERRED CODE ON SIGNS (TYPE)

Type	Chinese	English
Top-down	207	0
Bottom-up	38	16
Sum	245	16

B. Physical Characteristics

The physical characteristics of the LL can be summarized from the font, material, form, color of the language signs and the decorations surrounding them. According to the investigation at the research sites, most of the LL was well-designed with unique physical characteristics. As shown in Figure 1, 2 and 3, top-down signs such as direction



Figure 1 A Direction Sign



Figure 2 A Notice Sign



Figure 3 A Notice Sign

signs and notice signs in the scenic spots used dark boards with the same material, and there were white characters or letters on the boards and some pictures next to them. Most of the shop signs in the scenic spots used black boards with golden Chinese characters, the font of which might be in traditional, handwritten forms. And there might be some antique lanterns hanging next to the signs as decorations.

Some shop owners would like to use some shop signs in forms that were rather popular in ancient China, such as horizontal inscribed boards, couplets in Figure 4 and flag-like signs in Figure 5. Different from the shop signs in the scenic spots, those signs along the streets were transformed into the signs with uniform colors and fonts in the government renovation project, as shown in Figure 6. Although the majority of the signs were pleasant to eyes at the research sites, there were a few signs with illegible characters and letters on them. Examples were shown in Figure 7 and Figure 8.



Figure 4 A Shop Sign



Figure 5 A Shop Sign



Figure 6 A Shop Sign



Figure 7 A Warning Sign



Figure 8 A Notice Sign

C. Cultural and Historical Elements

In the investigation, we found that the LL in Shaoxing contained rich cultural and historical elements. In addition to the fonts, plaques, couplets, and signs with unique characteristics mentioned above, there were many other elements that reflected the ancient atmosphere, including the handwriting of Wang Xizhi, the sage of calligraphy, on the walls of the historic site, advertisement signs of yellow wine popsicles and local snacks, shop signs with the character “Ge (阁)”, “Fang (坊)”, or “Xuan (轩)”, and place names such as “Bazi Bridge”, “Yuhua Bridge”, “Tishan Bridge” and “Duopo Lane” reflecting the culture of bridge or celebrities. As an example shown in Figure 9, information signs introducing celebrities, scenic spots and place names were the most direct way of reflecting of local culture and history.



Figure 9 An Information Sign

D. Translation of Texts on Bilingual and Multilingual Signs

After examining the Chinese-English translation on 261 bilingual and multilingual signs, the author found that most of the translation was standard and accurate, and only a few signs had translation problems, which could lead to misunderstanding or failure in understanding. The following were some examples of the existing problems. At the entrance of The Native Place of Lu Xun, the translation of “了解绍兴古文化，从水上开始” was “To know about the ancient culture of Shaoxing shall start from the water”. It might be better to add “we” before “shall start from the water”. In the instructions for taking a boat, some spelling and punctuation mistakes were found, such as “Please do not get no or off the boat” and “Do not put your head, hand or foot out of the boat”. By comparison, there were more mistakes on the warning signs. “办公区域，请勿入内” was translated as “Regional Office Do Not Enter Inside”. “小心落水” was translated as “Drowning carefully”. And “游客止步” was translated as “Tourist Stop”. There were also inconsistent translation versions. For example, “乌篷船码头” was translated in three different ways, as “Wupeng Boat Wharf”, “Wharf of Black-awning Boats” and “Pleasure Boat Pier”.

E. Multimodal Signs

LL includes linguistic symbols both in the form of text and in the form of picture, audio, and video. In the investigation, it was found that the multimodal forms of LL had become increasingly common. Pictures next to the texts, videos of the city or the scenic spots, and slogans on electronic screens were all considered as common multimodal language signs. Furthermore, tourists could easily obtain the audio or video introduction to the destination by scanning the QR code (Figure 10) with their smart phones at some research sites. Another example was shown in Figure 11. By scanning the QR code, tourists could listen to 100 stories about this ancient city, which were presented in four languages: Chinese, English, Korean and Japanese. These stories provided tourists with an opportunity to better understand the history and culture of Shaoxing during the trip.



Figure 10. A Multimodal Sign



Figure 11. A Multimodal Sign

F. Attitudes and Perceptions

In order to investigate tourists’ different attitude towards LL in the scenic spots and on the streets, and also the general attitude towards LL in Shaoxing, they were asked firstly to give their opinion more concretely by evaluating the degree of satisfaction with LL. They gave their response on a Likert scale ranging from 1-“strongly dissatisfaction” to 5-“strongly satisfaction”. According to the results shown in Table 8, interviewees were satisfied with LL at the research sites. But comparatively, they were less satisfied with LL in the scenic spots than that on the streets. Then they were

asked to give their specific opinions on LL. The following were excerpts from the interview.

TABLE 8
TOURISTS' ATTITUDES TOWARDS LL

Type	LL in the scenic spots	LL on the streets	LL in general
Mean	3.8	4	4

Excerpt 1

Most of the shops use wooden signs or plaques. The antique linguistic landscape is a major feature of this cultural and historical city, which improves the image of the city. Most signs on the streets, however, only meet the requirements of simplicity and clarity, and the overall style is different and somewhat dazzling.

Excerpt 2

Many signs use a combination of pictures and texts, which is easier for people to understand. However, some QR codes posted in the scenic spots are not waterproof, which makes them unable to be scanned after prolonged exposure to rain and sun. And some wooden signs or stone monuments are also damaged due to the exposure, causing difficulties in recognizing the characters and letters and finally leading to the failure to obtain the information correctly.

Excerpt 3

There are a variety of font styles on the signs, but sometimes they are too complicated to read. And some signs cause confusion for tourists due to translation, typesetting or punctuation problems, which are not conducive to the construction of the city image.

V. DISCUSSION

A. *The Interactions Between LL and Its Environment*

“Haugen Model” emphasized the relationship between language and its environment. Language and the environment interact and influence each other, that is, language depends on the environment, and the environment affects the generation, use and development of language; language is not only a tool for understanding the world, but also a tool that acts on the environment (Liu, 2018). The study of LL is first and foremost a study in the field of sociolinguistics, focusing on the study of “language”; meanwhile, LL is a form of landscape and also an important part of the environment. Therefore, there must be close and active interactions between LL and the environment.

The natural environment is a prerequisite for human survival and development and exerts a great impact on human beings. Therefore, the creation and production of LL is also influenced by the natural environment. Shaoxing is a city of water in the south of the Yangtze River, where rivers, lakes and bridges are rather common, so we can find “river”, “lake” or “bridge” in the names of places in Shaoxing. At the research sites, the names “Bazi Bridge” and “Yuhua Bridge” are related to this natural geographical environment. In addition, many signs are made of wood or stone, which brings a sense of nature, neatness, and simplicity, and are well integrated with the surrounding environment. Exquisitely made and properly placed signs will beautify the natural environment and improve the environmental quality.

LL is a mirror of society, reflecting all aspects of the social and cultural environment. First, the national language policy attaches great importance to and strictly regulates the national language. The legal status of Putonghua (standard Mandarin) and standard Chinese characters as “national standard spoken and written language” has been established since “Law of the People’s Republic of China on the Standard Spoken and Written Chinese Language” was enacted in 2001. And according to “National Standard of Geographical Names—Signs” in 2008, Chinese characters and Pinyin should be used on the signs of streets, lanes, and buildings in urban and rural areas. These regulations have been well implemented in the official signs, determining the dominance of Chinese on the language signs and reflecting the identity of the national language. Second, globalization has led to the diversity of language. In the natural environment, we advocate the protection of biological diversity, and we should likewise protect the diversity of language in the language ecological environment. As every scenic spot receives a certain number of foreign tourists every year, the language set on the signs must meet their needs. English is an international language, so English should be the second language used in the scenic spots in China. And relatively speaking, there are more Korean and Japanese tourists in Shaoxing, so there will be signs in Chinese, English, Korean and Japanese in the better-known tourist attractions. Some shop owners have established English or bilingual signs that seem more fashionable and international to attract more foreign guests and make more money. However, there are some exceptions. In some scenic spots, such as Bazi Bridge and Cangqiao Historical Street, tourists may be more interested in appreciating “cultural experience”, so bilingual or multilingual signs can seldom be found there. Third, the development of society and the advancement of science and technology have contributed to the emergence of multimodal language signs, which can be regarded as a symbol of modernization. The multimodal signs in the form of picture, audio and video provide tourists with rich information, presenting various forms of LL. Fourth, the history and culture of a city influence the creation and presentation of LL. The LL of the city is the carrier of the history and culture of the city, and contains its unique cultural essence. The ancient characters on the signs, the traditional sign forms, the unique names of the places, decorations and advertising signs that carry the regional culture can all give a strong sense of traditional local culture.

At the same time, LL also affects the social and cultural environment to a great extent. Posters on the roads and at the

scenic spots educate the public about socialist core values, social moral models, tradition and virtues, which fully embodies the educational function of LL and helps build a socialist society with advanced ethical standards. Furthermore, by telling stories about the history and culture through the LL, the history and culture of this ancient city could be inherited and developed, and the communication and exchange between different cultures could be realized.

B. Existing Ecological Problems

From the discussion above, it can be concluded that there have been sound interactions between the LL and the environment at the research sites, showing harmonious language ecology at the same time. However, there are also some ecological problems that could exert a negative impact on the language ecology of the city.

First, some of the signs are in relatively bad condition and disorganized. As mentioned by some tourists in the interview, some signs have been damaged due to prolonged exposure to the natural environment. And some shop signs, especially those on the streets, are not standard or too personalized so that they are not in harmony with the surrounding environment. Since these signs have not been maintained and replaced in time by the administrative departments, their functions as instructions and advertisements have been lost. These signs not only fail to serve tourists, but also affect the image of the city. Second, multimodal language signs are not common enough. Nowadays, multimodal signs could only be accessed through electronic screens or QR codes by the tourists in a few scenic spots, which obviously can no longer satisfy and attract more tourists. Third, the proportion of bilingual and multilingual signs is not high. A total of 261 cases of bilingual and multilingual signs were collected at the research sites, accounting for 35.2%. And most of them were top-down signs. Most of the shop signs and direction signs on the streets were monolingual, which could not provide sufficient information for foreign tourists. Moreover, the audio or video obtained through the QR code is mostly in Chinese and can only serve domestic tourists. Fourth, there are still a few mistakes in the translation of the signs. Liu (2020) investigated the local language ecology from the perspective of LL translation in Sanya City, Hainan Province, and found that there were problems in terms of spelling, expression, information, and culture. As mentioned earlier, the author found similar problems in this study.

To address the existing ecological problems, first of all, the government and relevant administrative departments should strengthen supervision and management, and maintain, repair and even replace those unpleasant language signs on a regular basis. At the same time, they are supposed to actively introduce advanced technology and combine the technology with construction of LL to improve the quality of LL and build smart scenic spots and a smart city. Secondly, the staff of relevant departments and the citizens should try to improve their language skills and language ecological literacy. It is essential for them to learn relevant laws and rules on language use, and learn more than one foreign language, for it could help to improve language diversity and the quality of sign translation.

VI. CONCLUSIONS

Taking the LL of Shaoxing, a national historical and cultural city, as the research subject, this study investigated the LL of 6 famous scenic spots and 2 main streets in the old district of the city and conducted a small-scale interview among tourists. The main results of the present investigation can be summarized as follows. About two-thirds of the signs are monolingual with a relatively small proportion of bilingual and multilingual signs. "Chinese characters only" is the most common mode and Chinese is the preferred language code in most cases. The cultural and historical elements can be found not only in the font, material, form, color and surrounding decorations of the signs, but also in naming of the places, and the setting of information signs telling historical and cultural stories. The Chinese-English translation on bilingual and multilingual signs is standard, except for the mistakes on a few signs. The emergence of multimodal signs gives the information function of LL a better play. The results of interviews with the tourists show that the tourists are satisfied with the LL in Shaoxing, and believe that the LL reflects a good city image and has a high degree of cultural recognition, though there are still some areas that need to be improved. Based on the results, the author analyzes the harmonious state of language ecology and some existing language ecological problems from the interactions between LL and the natural, social and cultural environment.

An investigation on the LL of a region provides an insight into the current situation of the LL and discussion on the interactions between the LL and its environment can reveal the language ecology of the region. To a certain extent, the LL of a city can not only objectively reflect the city image, but also present the economic development of the city and the language and cultural identity of the citizens. The results of this study can provide some references for the language policy makers and city planning decision makers, in order to build better LL, create harmonious language ecology, improve the city image, and promote the construction of spiritual civilization and economic development in the city. However, it should be noted that this study is limited by the lack of interviews with residents and sign producers. Collecting information from them could have yielded fruitful insights into how the signs were created and perceived. Moreover, this research does not cover more sites in the city because of the lack of time and researchers. An investigation on LL at more sites and that in the virtual world, such as LL on webpages would produce a fuller picture of LL and a more nuanced analysis of language ecology in this city. Notwithstanding these limitations, it is essential to suggest that more researchers pay attention to the protection, inheritance and development of LL, and experts and scholars from a wider range of fields jointly conduct research on LL with Chinese characteristics, construct theoretical framework suitable for China's national conditions, and finally accelerate the process of globalization and

internationalization in China.

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