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Visual Symbols and Information Communication in Linguistic Landscape: A Case Study of Shougang Park

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Abstract: Within linguistic landscapes, visual symbols serve as a principal medium for conveying meaning, yet their communicative effectiveness largely depends on observable design properties. Focusing on Shougang Park—a decommissioned Beijing steelworks repurposed as an industrial-heritage site—this study investigates the visual components of on-site signage and their communicative effectiveness. Drawing on Backhaus's sign-survey procedure with photographic documentation, we coded 154 signs across six dimensions: typeface legibility, layout rationality, icon configuration, color application, image–text relations, and visual symbol standardization. An audience perception survey supplemented the analysis. The overall visual design proves acceptable, yet the analysis identifies four problems: a low icon configuration rate, a relatively high visual-symbol problem rate, suboptimal image–text relations, and inconsistent color clarity. Some visual-symbol designs have furthermore not effectively responded to the spatial character of the industrial heritage. On this basis, the study proposes optimization principles and specific measures, offering a theoretical and practical reference for visual communication design at industrial-heritage spaces.

Keywords: Linguistic landscape; Visual symbols; Information communication; Industrial heritage

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1. Introduction

Shougang Park sits in western Beijing and began life as a major steelworks. The plant shut down and moved ahead of the 2008 Beijing Olympics; the site was later redeveloped, and today it hosts international sports, exhibition, and cultural events. Those events draw steady crowds, and the signs on site—directional, informational, warning—are what most visitors rely on to find their way and understand what they see.

Visual symbols refer to symbolic forms that convey information through visual media, including non-linguistic elements such as images, graphics, colors, typefaces, and layout. Peirce (1902) laid the groundwork with his triadic model of icons, indices, and symbols, and later linguistic-landscape work moved past simply

counting languages to asking how visual resources carry meaning [1]. Building on geosemiotics and visual grammar, researchers have studied the images, colors, layouts, and typefaces of public signs [2,3]; Jaworski and Thurlow (2010) pushed the field further by adding material and sensory dimensions, which set up the multimodal turn this study draws on [4].

Industrial heritage has received comparatively little of this attention. Kim and Ahn (2025) looked at Seoul's Seongsudong district and found shops using mostly Roman script with little Korean signage—a pattern that nodded to the area's industrial past while pushing it to the visual margins, and that shows how hard it is to match sign design to a site's local and historical character [5]. Chinese work has started to apply visual methods to tourism [6-8] and to commercial linguistic landscapes [9-10], but the visual side of heritage signage is still understudied relative to its textual side.

Shougang Park is a good place to test these questions. Its preserved blast furnaces, cooling towers, and pipework give signage a material context unlike that of a generic public square. We documented 154 signs there, looking at typeface, layout, iconography, color, and the relation between image and text, and we asked visitors how well the signs worked for them. The aim is plain: to show what is wrong with the current signage and to suggest how it might sit better within an industrial-heritage setting.

2. Research design

2.1. Research object

The study recorded 154 signs in the parts of Shougang Park open to visitors. They fall into six groups: road-direction signs, venue-information boards, warning and notice signs, commercial signs, heritage-interpretation panels, and temporary event signs. These are spread across four zones: the heritage-industrial area, the former Winter Olympic venues, the commercial district, and open public space.

2.2. Research content

The analysis of Shougang Park's visual signage proceeds in four parts.

2.2.1. Documentation of visual components

The visual record begins with what each sign looks like: its typeface and how legible it is, how the elements are laid out, whether its icons read clearly, and how its colors contrast. We photographed every sign on site and entered the observations into a structured coding sheet, which together form a database of the park's signage.

2.2.2. Analysis of image–text relations

A second line of analysis considers how images and words share a sign. The coding checked whether a picture matches its text, whether it actually shows what the words claim, and whether the pairing helps a visitor understand. What matters in practice is whether the image–text combination makes the sign easier to read, or merely busier.

2.2.3. Assessment of visitor perception

Visitor perception was assessed through questionnaires and short interviews, which captured how clear, visible, and usable people found the signs. The replies point to the specific design features that need work.

2.2.4. Integration with the industrial heritage environment

The last part asks how well the signage fits the industrial setting. The relevant question is whether the signs pick up on the material and form of the old steelworks—the rust, the scale, the geometry—or simply ignore it. From that fit come practical strategies for placing signage inside post-industrial heritage spaces.

2.3. Research methods

This study employs a combined qualitative and quantitative approach to examine the visual symbol configuration and communication effects of the linguistic landscape in Shougang Park from multiple dimensions.

First, the researchers conducted field surveys and visual documentation. Between April and May 2026, the researchers conducted field surveys at Shougang Park, systematically photographing and documenting various types of signage in the park's public spaces. The researchers collected 154 valid samples, including road directional signs, venue information signs, warning and notice signs, commercial signage, cultural interpretation signs, and temporary signage.

Second, quantitative coding analysis. Drawing on the geographical semiotics analysis framework proposed by Scollon and Scollon (2003) and the theory of visual grammar developed by Kress and van Leeuwen (1996) [2-3], this study converted the various constituent elements of visual symbols—font type and legibility, layout and spatial organization, icon configuration and comprehensibility, and color application and clarity—into quantifiable indicators for statistical analysis.

Third, an audience perception questionnaire survey. To obtain first-hand experiential data from sign users—and as noted by Shang and Zhao (2014) [11], "research on the linguistic landscape has gradually shifted from simple language counting to a focus on audience perception and experience—data on audience perception provides important validation and supplementation for the quantitative analysis." This study designed a bilingual (Chinese-English) questionnaire, which was distributed through a combination of online and offline channels. The questionnaire included closed-ended scale questions and open-ended questions. A total of 91 valid questionnaires were collected, including 71 from domestic respondents and 20 from foreign respondents.

Fourth, the comparative analysis method. This study compares the differences in the arrangement of visual symbols across different functional types of signage and examines the differences in perceptual evaluations between domestic and foreign respondents to reveal the functional appropriateness of visual symbol design and its cross-cultural communication effectiveness.

2.4. Analytical framework

The analytical framework of this study integrates theories of visual semiotics with cutting-edge findings in language landscape research, evaluating five core dimensions:

In terms of typeface, the study assesses the appropriateness of typeface selection, the alignment of font size with information hierarchy, and legibility in outdoor environments.

In terms of layout, examine the spatial organization of information, the relationship between information density and white space, and the harmony of multilingual typesetting. A reasonable layout directly affects reading efficiency and the speed of information retrieval.

In terms of graphics, analyze the presence or absence of icons, the degree of design standardization, and their comprehensibility. Li (2019) emphasizes that "graphic symbols are an important medium for conveying

information, and their design and application directly influence the effectiveness of visual communication [12].” As the type of visual symbol with the highest efficiency in cross-linguistic communication, icons possess irreplaceable functional value in the linguistic landscape.

In the color dimension, evaluate the clarity of colors, the contrast between background and foreground, and the harmony with the industrial heritage environment.

Image-text relationship dimension. Analyze how images and text correspond. Analyze how they complement each other. Analyze how they integrate in the layout. Luo and Xu (2025) point out that “the semantic relationships between images and text can be classified into various types, and the way images and text are combined directly affects the overall comprehensibility of the information [13].”

3. Results and analysis

We did a statistical analysis of field photograph records. The evaluation results for each dimension are below.

3.1. Typeface legibility

The park has 151 signs with text. 11 signs (7.3%) were rated “poor.” Overall, the park’s sign legibility is acceptable. The “poor” signs are mostly on the outskirts of the industrial heritage area. Some are temporary signs installed in the early stages. These signs have several problems. First, the font size is too small. It is hard to read under outdoor lighting. Second, the font choice is non-standard. Some use non-standard typefaces. Their strokes are too thin or too ornate. They are hard to recognize from a distance. Third, text and background do not contrast enough. The information is hard to extract.

3.2. Layout rationality

138 signs (89.6%) were rated as having a “reasonable” layout. This high rate means the park’s signs mostly follow design standards. These standards require a clear information hierarchy and balanced use of space.

Problems still exist. First, some interpretive signs have too much information. They cram too much text into a limited space. This makes font sizes small. Line spacing is not sufficient. Readability suffers badly. This problem is especially clear in interpretive signs for industrial heritage spaces. Their content covers multidimensional information such as historical background and technical principles. The layout design does not effectively separate core information from supplementary information. This creates “information overload.” Wu and Fan (2018) noted, “Readability has become the paramount principle guiding layout design; overly crowded layouts run counter to the audience’s actual reading experience needs [14].”

In the context of industrial heritage, layout design must also consider the relationship between signs and the scale and materials of surrounding industrial buildings. Layouts that are too small or too dense are easily “swallowed up” against the backdrop of massive industrial structures. They lose their visual prominence. Wang (2026) points out, “In industrial heritage spaces such as Shougang, landscape design must balance aesthetic value with practical function, and the signage system should engage in a dialogue with the site’s spatial characteristics [15].”

3.3. Icon configuration and comprehensibility

Of the 154 signs sampled, 90 (58.4%) carried icons while 64 (41.6%) did not. 88 of the 90 icon-bearing signs

(97.8%) proved easy to grasp; merely 2 (2.2%) fell short.

First, the absence of icons in over 40% of cases forces readers to rely on text alone. Directional and service signs suffer most, since scanning words costs time that a symbol would save. For instance, the warning board at No. 2 Blast Furnace displays only Chinese characters, with no pictogram at all, leaving foreign visitors unable to decipher its message.

Second, one poor case was about the wrong direction. The directional signs at QUNMINGHU Street and LIAOCANG Road had icons that did not show the right direction. Visitors could not find the real path.

3.4. Color application and clarity

Among the 154 sample signs, 130 (84.4%) were clear in color clarity, 14 (9.1%) were fair, and 10 (6.5%) were unclear. Fading was a big problem.

First, the yellow warning sign on a power pole near Qunming Lake had faded a lot. The warning color was almost gone. The pole was in the sun all day. Beijing's strong summer UV and ground reflection made the color break down faster.

Second, the sign about Dry Dedusting at Shougang Park did not have enough contrast between the text and the background. In sunlight, the bright white text turned gray-white and mixed with the gray background. It became hard to read.

3.5. Image–text relations

Among the 154 sample signs, 114 (74.0%) had no clear problems in image-text relations, 13 (8.4%) had a mismatch, and 27 (17.5%) had neither images nor text.

First, on the map panel, the images were very small. Key buildings and paths could not be seen. There were too many graphics, so the text was hard to read. Visitors could not see clearly.

Second, some images and text did not match. For example, on the directional signs for the coaches' lounge and athletes' lounge at the "Four Ice Rinks," the icons did not match the places in the text. This shows there was no rule for "one-to-one check" in content review. The image-text relation changed from complementary to vague.

3.6. Comprehensive assessment

First, icon coverage and standardization were not enough. More than 40% of the signs had no icons. They did not use the most cross-linguistically effective visual elements well. On the panels, graphics were too crowded, and key buildings could not be seen. This shows that icons were only "present" but not "good."

Second, the color design had a problem between function and art. Some signs gave up clarity to match the feel of the old industrial space. Low-contrast designs made the space look historic, but they made it harder to share information. The dry dust removal sign is one example. The text and background colors were too close. In sunlight, they could not be told apart. Function gave way to beauty.

Third, visual symbol design did not work well with the features of the industrial heritage. Current designs were mostly standard and the same. The shape, material, color, and nearby industrial buildings did not talk to each other. Faded warning signs and mismatched directional signs did not turn Shougang's special industrial memory into a clear visual language. So the signage system felt like a simple copy of common products, not a continuation of the site's spirit.

3.7. Audience perception

All the data below are derived from our sampled questionnaire survey in Shougang Park during the research period. A total of 91 effective questionnaires were returned (71 from domestic respondents and 20 from foreign respondents), which revealed that the majority of respondents approved of the overall visual design, but also highlighted a number of issues.

First, foreign respondents rated the legibility of English signage poorly; 75% of them reported problems with it. “Spelling errors”, “Grammar errors”, and “Unnatural or awkward English” are the most frequent problems. Furthermore, about 80% of foreign respondents expressed a desire to include additional languages, which aligns with the finding in 2.3 that multilingual signage accounted for only 0.6%.

Second, many domestic respondents reported the poor readability of the signage. In open-ended questions, several domestic respondents pointed out that the density of signage in the park was limited, with some sites lacking continuous guidance; some noted that information on explanatory panels was limited and expressed a desire for more details on the historical background of the industrial heritage spaces; elderly visitors reported that the font size on certain signage is too small, making it difficult to read.

4. Recommendations

4.1. Establish a comprehensive icon system

The survey results show that 64 of the 154 signs lacked icons (about 41.6%). Directional and warning signs are the most significant parts, which impede cross-linguistic recognition and communication. Existing icons also suffer from issues such as non-unified styles and fail to comply with national standards.

Two approaches may be adopted. First, adopt GB/T 10001.1-2023 as a benchmark [16]. In public spaces such as toilets and lifts, where the regulations already exist, national standard graphics should be used; Icons must accompany all of the directional signage, whilst warning signage should be accompanied by icons as much as possible; the industrial heritage introduction signage should be designed as an extension of the national standards, whilst maintaining a consistent style. Second, compile a park icon specification manual to systematically summarize the use of graphics and symbols, dimensional and color standards, and text-graphic combination rules within the park, to ensure institutional uniformity.

4.2. Optimize hierarchical typographic design

Some directional signs fail to sufficiently distinguish between primary and secondary information, thereby reducing navigation efficiency; introductory signs in the industrial zone contain limited information; the font size on certain signs is too small for elderly visitors.

A three-level information hierarchy standard should be established. Primary information (destination name) should be presented in bold and in the largest font size to ensure conciseness and be eye-catching; secondary information (functional descriptions) should be presented in a standard font size and centered, making it easy to identify at a glance when necessary; supplementary information (English translations and detailed explanations) should be in the smallest font size to facilitate rapid scanning. Moreover, the parameters of signage should be managed according to a unified requirement, and the responsible department should conduct a basic review of typeface usage during production. For example, use a sans-serif font, maintain line spacing at 1.5 times the font size or more.

4.3. Balance color functionality with industrial aesthetics

Within the overall signage system, 10 signs (6.5%) show poor color clarity due to fading; the color application lacks a unified plan for the whole park.

Two relevant suggestions are recommended. First, prioritize functionality with a zoned strategy. The contrast between text and background can meet the AA level (4.5:1) by GB/T 29799-2013; high-contrast white text on a deep blue background may be better used at transport hubs; cool color tones can be incorporated into Winter Olympics venue sites; the core industrial heritage space may use subtle metallic color to echo the industrial materials, and so on. Second, ensure durability through materials and establish institutional safeguards. Use UV-resistant and outdoor-grade ink with lamination; establish a color application guide just like GB/T 20501.6-2013 to clarify the primary color scheme, zone-specific color schemes, and prohibited combinations (such as red and green, which are problematic for color-blind users) [17-18].

4.4. Enhance communication efficiency through integrated image-text design

The functions of text and images should be well connected and cooperate, rather than being regarded as separate elements. As for guiding, service, and warning signs, the commonly used icons and brief and clear texts can be integrated, making the information easier to understand, especially for visitors from different language backgrounds, as pointed out by Foster and Afzalnia (2005) [19]. In Shougang Park, this problem is particularly important because the park receives visitors with different language backgrounds. According to the survey data, 41.6% of signs lack visual signs and the correct correspondence between texts and images. Therefore, the signs should be used more consistently and directly match the texts. Meanwhile, too many figures could make the signs more unreadable. The chart, core information, and supplementary texts should be distinguished more clearly so that the visitors can better understand the main information quickly, as suggested by Fiori (2010) [20].

4.5. Develop a visual style responsive to industrial heritage

It is a lasting process to improve the visual signs, instead of a one-off design task [21]. As suggested by Zhang et al. (2020) [22], a set of regular assessment systems should be established, in which the readability, sign intelligibility, correspondence between texts and images, color clarity, environmental compatibility, and user satisfaction can be well examined. When making further adjustments, feedback from different groups of visitors (especially international visitors and elderly visitors) can be a reference. Besides, signs should also be checked regularly for problems caused by weathering, outdated information, inconsistent icon styles, or changes in the functions of different spaces. A standardized visual symbol database and maintenance record could also help with further updates, as suggested by Mishler and Neider (2017) [23]. Such a mechanism can help Shougang Park maintain communication efficiency and visual consistency while responding to changes in visitor needs.

4.6. Establish evaluation and updating mechanisms

The improvement of visual symbols should be seen as an ongoing process rather than a one-time design task. A regular evaluation mechanism could be established to examine signs in terms of legibility, icon comprehensibility, image-text correspondence, color clarity, environmental compatibility, and user satisfaction, as suggested by Zhang et al. (2020) [22]. Feedback from different groups of visitors, especially international and elderly visitors, could be considered when making further adjustments. Signs should also be

checked regularly for problems caused by weathering, outdated information, inconsistent icon styles, or changes in the functions of different spaces. A standardized visual symbol database and maintenance record could also help with future updates, as proposed by Mishler and Neider (2017) [23]. Such a mechanism may help Shougang Park maintain communication efficiency and visual consistency while responding to changes in visitor needs.

5. Conclusion

This study examined the visual symbols and information communication of the linguistic landscape in Shougang Park through field surveys, photographic documentation, quantitative coding, and an audience perception survey. A total of 154 signs were analyzed in terms of typography, layout, icons, color, and image-text relations. The study also considered how visual design affects communication efficiency and how signs relate to the industrial heritage environment.

The findings suggest that the overall visual design of Shougang Park is generally acceptable, but some problems still exist. Icon coverage is not high enough, some image-text relations are not effective, color clarity is sometimes affected, and visual symbols are not yet closely connected with the characteristics of the industrial heritage. These findings suggest that the effectiveness of a linguistic landscape may depend not only on the accuracy of written language, but also on the way visual symbols, spatial design, color, and the surrounding environment work together.

Based on these findings, the future development of the linguistic landscape in Shougang Park could pay more attention to the balance between communication efficiency, visual consistency, and heritage identity. Signs should not only tell visitors where to go or provide information, but could also become part of the visual character of the park. For industrial heritage spaces such as Shougang Park, this study suggests that a well-designed linguistic landscape can work not only as an information system, but also as a way to communicate cultural memory and strengthen people's understanding of the place.

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