

Top-Down Governance and Bottom-Up Practices in a Tourism Linguistic Landscape: A Geosemiotic Study of Xi'an's Grand Tang Mall

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Abstract: *Tourism linguistic landscape research has documented multilingual visibility extensively, but less attention has been paid to how sign authorship is associated with the organization and functional distribution of linguistic resources within the same tourism space. This study examines 846 publicly visible signs collected at Xi'an's Grand Tang Mall to compare top-down and bottom-up signage in terms of language repertoire, spatial arrangement, multilingual information relations, code priority, script form, and Chinese linguistic variants. Quantitative comparisons were combined with geosemiotically informed interpretation of selected signs. The results show a strongly Chinese-centred landscape with marked differences between the two actor groups. Top-down signs displayed broader multilingual repertoires, highly regular spatial arrangements, and predominantly duplicating information across languages, whereas bottom-up signs used fewer languages on average but showed greater variation in information distribution, visual priority, spatial organization, and localized linguistic forms. The strongest associations concerned language repertoire, while script form showed no reliable authorship difference. A signboard-only sensitivity analysis substantially reduced several full-corpus contrasts, indicating that authorship and sign function are closely intertwined. Functionally, the findings distinguish multilingual availability from information equivalence: displaying more languages does not necessarily entail more differentiated information. Symbolically, Chinese retained a stable visual centre, while English prominence, Tang-related references, and dialectal expressions provided more selective resources for global, historical, and local positioning. The study proposes an actor–configuration–function account of tourism linguistic landscapes that connects authorship with observable sign organization while avoiding causal interpretations of actor categories.*

Keywords: Linguistic landscape, Tourism geosemiotics, Sign authorship, Multilingual signage, Informational equivalence, Grand Tang Mall.

1. Introduction

Linguistic landscapes (LLs) provide observable evidence of how languages are selected, displayed, and ordered in public space. Originally defined through the visibility and salience of languages on public and commercial signs, the concept has subsequently been used to examine not only patterns of language presence but also the social meanings associated with their distribution [1]. Public signs perform an informational function by making linguistic information available within a particular territory, while their relative visibility also carries a symbolic function associated with language status, group identity, and power. Linguistic choice alone, however, does not determine how these functions are organized. Language order, visual prominence, spatial arrangement, and material presentation also affect how linguistic resources are encountered and interpreted. A geosemiotic perspective therefore complements linguistic-landscape analysis by directing attention to the spatial and visual organization of discourse in material environments [2].

Tourism settings make these relationships particularly visible because linguistic signs operate in spaces characterized by visitor mobility, multilingual communication, institutional management, cultural representation, and commercial activity. Public-service information, directional signage, commercial displays, shop signs, restaurant names, and advertisements may address different audiences and perform different communicative functions within the same destination [3]. Multilingual visibility in such settings cannot therefore be interpreted solely in terms of the number of languages displayed. The informational and symbolic significance of a

linguistic resource also depends on who produces the sign and how languages are organized, prioritized, and distributed within it.

The distinction between top-down and bottom-up signs provides an established basis for examining differences in sign authorship [4]. Top-down signs are generally associated with governmental, institutional, or public-service actors, whereas bottom-up signs are produced primarily by businesses and other private actors. Authorship itself, however, does not explain linguistic choice. Different actor groups occupy different institutional positions, address partly different audiences, and operate under different degrees of regulation and standardization. Recent research in Chinese urban settings has shown that institutional structures and situated agency are associated with recurrent differences in linguistic and semiotic organization [5]. The analytical task is therefore not merely to classify signs by authorship, but to determine whether different actor positions are systematically associated with differences in language repertoire, code priority, spatial organization, and visual form.

Xi'an's Grand Tang Mall provides a focused setting in which these relationships can be examined. As a tourism-commercial pedestrian district organized around representations of Tang cultural heritage, it contains both institutionally managed public signage and densely distributed commercial signage. Recent research on tourism linguistic landscapes in Xi'an has shown that language practices are intertwined with cultural pride and tourism-oriented profit, with Chinese occupying a dominant position while English and other foreign languages participate in international-tourism communication and commercial

representation [6]. Whereas this research examines pride, profit, and translanguaging across multiple tourism sites, the present study focuses on one spatially bounded tourism district in order to examine systematic within-site differences between top-down and bottom-up signs.

Such differences cannot be adequately identified from language presence alone. The same languages may occur on different signs while occupying unequal positions in visual hierarchy, spatial arrangement, and information structure. From a geosemiotic perspective, recurrent code preference, spatial organization, and inscription-related features provide evidence of how linguistic resources are materially differentiated [2]. These configurations can in turn be related to the informational and symbolic functions identified in linguistic-landscape research [1]. At the informational level, language selection and cross-language information relations affect what information is available and how it is distributed among linguistic codes. At the symbolic level, recurrent differences in visual priority and linguistic form may index language hierarchy, cultural positioning, and institutionalized linguistic norms. The relationship between actor position, observable configuration, and functional interpretation therefore constitutes the central analytical problem of the present study.

Existing research has established that tourism linguistic landscapes are shaped by multilingual communication, institutional structures, heritage representation, and commercial practice [3]-[6]. What remains less clearly specified is how actor differentiation becomes materially observable within the same tourism space. In particular, multilingual visibility does not necessarily entail informational equivalence, while the co-presence of languages does not imply equal symbolic priority. A more precise account therefore requires attention not only to which languages occur, but also to how linguistic repertoires, code priority, spatial arrangement, and multilingual information are organized across different categories of sign authorship. Drawing on a corpus of 846 signs collected at the Grand Tang Mall, the present study combines actor-based comparison with geosemiotically informed analysis to examine these relationships.

Accordingly, the study addresses the following research questions:

RQ1: How do top-down and bottom-up signs differ in language choice and geosemiotic configuration in Xi'an's Grand Tang Mall?

RQ2: How do these differences contribute to the informational and symbolic organization of the linguistic landscape?

By addressing these questions, the study moves beyond a descriptive comparison of language presence to examine how sign authorship is associated with recurrent linguistic and spatial-semiotic configurations. It further distinguishes multilingual visibility from multilingual information distribution and relates observable patterns of code priority, spatial organization, and linguistic form to informational and symbolic interpretation. In doing so, the study develops an

actor-configuration-function account of how institutionally managed and privately produced signs jointly organize a tourism linguistic landscape.

2. Literature Review and Analytical Framework

Research on tourism linguistic landscapes raises two closely related questions for the present study. One concerns function: the visibility of a language does not necessarily show how much information it carries or what symbolic position it occupies. The other concerns authorship: differences between institutional and commercial signs become meaningful only when they are linked to observable differences in linguistic and semiotic organization. Addressing these questions requires a framework that connects linguistic landscape functions, sign authorship, and the spatial and visual organization of multilingual signs. The following review develops these connections in turn.

2.1 Linguistic Landscapes in Tourism Spaces

Linguistic landscape research made written language in public space empirically observable by treating signs as evidence of the distribution and relative visibility of languages. The foundational distinction between informational and symbolic functions, however, shows why visibility cannot be reduced to frequency [1]. A language may appear because it provides information to a particular audience, because its presence carries social or cultural significance, or because these functions overlap. More recent accounts therefore approach public signs as situated resources through which language policy, identity, social differentiation, and relations of power become visible [7]. For the present study, the important implication is that identifying which languages occur is only a first step. Their function also depends on how linguistic resources are organized and what positions they occupy within the landscape.

Tourism settings make this distinction particularly important because linguistic resources serve several audiences and purposes within the same space. Visitors, local residents, public institutions, and commercial actors may encounter or use the same sign environment differently. Sociolinguistic research on tourism has shown that languages can function both as communicative resources and as signs of locality, authenticity, cosmopolitanism, or cultural difference [3], [8], [9]. These meanings are also shaped by the material environment in which language appears, including buildings, objects, visual design, and patterns of movement [8]. English on a tourist sign, for example, may provide substantial translated information, mark an international orientation, or perform both functions. Language presence alone therefore provides limited evidence of what multilingual signage actually does.

Research on Chinese heritage tourism illustrates this ambiguity particularly clearly. Traditional Chinese semiotic resources can contribute to the visual production of historical authenticity, while foreign languages may occupy a different position in the same commercialized heritage environment [10]. Similar processes have been documented in Lijiang, where Dongba script functions both as an ethnic identity

resource and as a commodified element of the tourism landscape [11]. More recent work further shows that heritage scripts may be recontextualized as visual spectacles whose tourism value is partly detached from their original communicative function [12]. Questions of accessibility and language safeguarding also arise in displays of intangible cultural heritage [13]. Studies of Wuzhen and Xi'an consequently suggest that tourism linguistic landscapes may accommodate traditional, modern, local, international, and commercial orientations at the same time [6], [14].

These studies also show why multilingualism should not automatically be equated with communicative inclusiveness. Several languages may appear on the same sign while carrying different amounts of information, and one language may be present largely for symbolic display. Conversely, a locally marked script may communicate little to many visitors while carrying considerable heritage or identity value. Informational and symbolic functions should therefore be distinguished in analysis even though they often operate together in practice [1]. The informational question concerns what content is available in each language; the symbolic question concerns the status, identities, and associations suggested by the way linguistic resources are displayed. This distinction leads to a further question that is central to the present study: who makes these selections?

2.2 Sign Authorship and Actor Differentiation

The top-down/bottom-up distinction addresses this question by locating signs within different structures of authorship and authority. Ben-Rafael et al. distinguished signs produced by institutional actors from those generated by private actors, while Backhaus operationalized a comparable official/non-official distinction in the systematic analysis of urban multilingual signage [4], [15]. Authorship, however, is not itself an explanation of linguistic choice. Spolsky argues that public sign choices are shaped by the linguistic resources available to sign writers, assumptions about intended readers, and the symbolic value attributed to particular languages [16]. These factors make actor differentiation analytically meaningful: institutional actors and private commercial actors may address different audiences, operate under different regulatory constraints, and assign different communicative or symbolic values to the same linguistic resources.

This distinction is especially relevant in the Chinese context, where publicly displayed multilingualism may reflect institutional language ordering as well as communicative demand. Shang's study of linguistic landscaping from above links the public display of English to internationalization, standard language ideology, and linguistic regulation [17]. Zhang and Zhang similarly show how institutional structure and situated agency become visible through recurrent linguistic and geosemiotic patterns [5]. Such studies also set an important evidential limit. Regularity in language order, visual prominence, or linguistic form can be treated as an observable feature of institutionally managed signage, but it does not by itself reveal the intentions of officials or individual sign producers.

Tourism research confirms that actor differences are empirically visible, although the dimensions compared vary

across studies. Work at African tourism sites has identified contrasts between government and privately produced signs in language selection and standardization [18]. Research in Seoul has combined sign authorship with multilingual prominence and symbolic language use [19]. Ai et al. likewise distinguish official and commercial practices in Xi'an, but their analysis is primarily concerned with pride, profit, and translanguaging across several tourism sites [6]. Less attention has been given to how authorship relates, within a single site, to several observable properties of signs at the same time. These include language repertoire, language combination, code priority, spatial arrangement, script and linguistic form, and the distribution of information across languages. Examining these features together makes it possible to ask whether top-down and bottom-up signage displays recurrently different forms of semiotic organization.

2.3 Geosemiotic Organization and Functional Interpretation

A geosemiotic perspective adds a material dimension to the analysis of sign authorship. Scollon and Scollon approach meaning as situated in the relationship between discourse and place, drawing attention to features such as code preference, inscription, and the physical positioning of signs [2]. The present study examines the spatial arrangement of linguistic codes within individual signs, including top to bottom, left to right, and other configurations. This variable is treated as an observable aspect of intra-sign organization. Code preference is examined through relative linguistic priority and visual dominance, while script form and culturally marked linguistic forms provide more limited evidence concerning inscriptional variation. Together, these features allow multilingual presence to be distinguished from multilingual hierarchy.

Spatial and visual hierarchy, however, does not show whether co-present languages carry equivalent information. Reh's reader-oriented typology distinguishes duplicating, fragmentary, overlapping, and complementary multilingual writing according to the relation between information presented in different languages [20]. Duplicating signs provide broadly equivalent content across codes, whereas fragmentary and overlapping forms distribute only part of the information across languages. Complementary writing assigns different information to different codes. The present study uses these categories as multilingual information relations because they provide a direct way to distinguish multilingual visibility from informational equivalence.

These observable sign features can then be related to informational and symbolic functions, although the two forms of interpretation do not rest on the same type of evidence. Information distribution can be established relatively directly by comparing textual content across languages. Recurrent code priority and visual prominence can also provide evidence of linguistic hierarchy. Claims about identity or language ideology require greater caution because they depend more heavily on cultural context, repeated patterns, and external policy or historical evidence. In the present study, such interpretations are made only where the coded patterns and contextual evidence support them [1], [2].

The framework used in this study therefore connects three

levels of analysis. Sign authorship identifies the institutional position from which a sign enters the landscape. Linguistic and semiotic features show how resources are organized within the sign. Informational and symbolic interpretation addresses what these recurrent configurations make available or make salient in the tourism space. The framework is deliberately composite. The distinction between informational and symbolic functions derives from linguistic landscape research [1], the analysis of material and hierarchical organization is informed by geosemiotics [2], and multilingual information relations follow Reh's typology [20]. Section 3 translates these concepts into the variables used in the empirical analysis.

3. Methodology

This study employs a comparative corpus-based design combining quantitative analysis with geosemiotic interpretation. Individual signs constitute the units of analysis. Sign authorship defines the primary comparison between top-down and bottom-up signs, while linguistic and geosemiotic variables are used to identify how the two actor categories differ in language choice and semiotic configuration. Quantitative patterns are subsequently interpreted in relation to the informational and symbolic functions outlined in Section 2.

3.1 Research Site

The study was conducted at the Grand Tang Mall in Xi'an, Shaanxi Province. Located near the Giant Wild Goose Pagoda in Qujiang New District, the pedestrian district combines tourism, cultural performance, public services, retail, catering, and leisure activities within an environment designed around representations of Tang cultural heritage. The district has been recognized as a national-level tourism and leisure block [21]. Its signage includes both institutionally managed public information and a dense range of privately produced commercial signs, allowing the two actor categories to be examined within the same spatially bounded tourism setting.

3.2 Data Collection

Data were collected through a systematic photographic survey accompanied by field observation. Four field visits were conducted between January and March 2024 along an approximately 2.5 km survey route (Figure 1). Publicly visible signs containing written language were photographed together with enough surrounding context to document both their linguistic content and visual presentation. The initial photographic corpus contained 930 items. Blurred images, duplicate photographs, and items that could not be coded reliably were excluded, leaving 846 signs for analysis. Photographic documentation of publicly visible signage is well established in linguistic landscape research and allows linguistic form to be examined together with its immediate material context [22], [23].

Following Backhaus [15], each sign with a clearly identifiable physical boundary was treated as one analytical unit. The corpus included relatively stable signs visible from public space, including directional and public-information signs, facility signs, shop and building names, advertisements,

promotional posters, and warning notices. The analysis concerns sign authorship and observable sign configuration rather than audience reception. Visitor comprehension, attitudes, satisfaction, and behavioral responses were therefore outside the scope of the study.

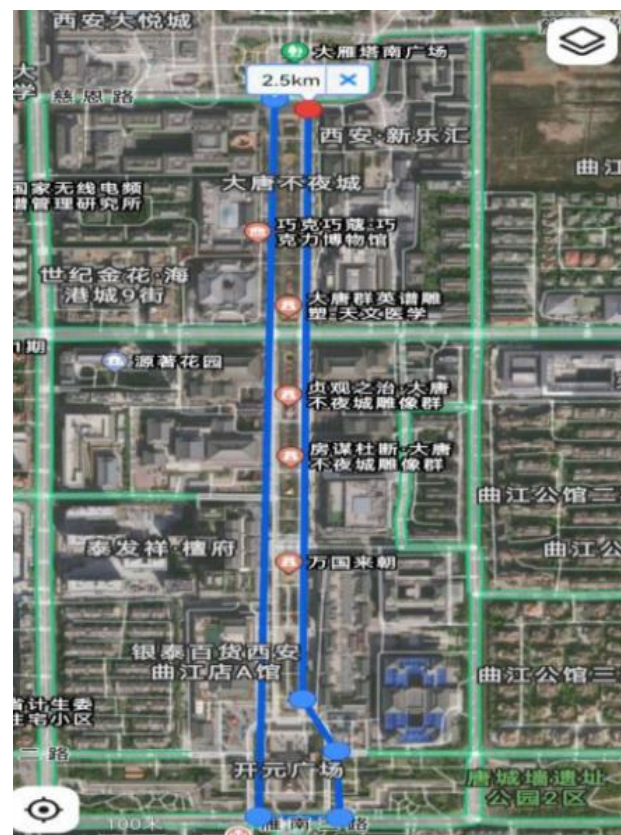


Figure 1: Survey route at the Grand Tang Mall



Figure 2: Sample Sign

3.3 Sign Classification

Signs were classified according to authorship and institutional status. Top-down signs were those issued, installed, or institutionally authorized by governmental or public-service bodies. These included directional signs, street and scenic guidance, and public-facility information. Bottom-up signs were produced by commercial or other private actors and included shop and restaurant signage, advertisements, and promotional displays. The final corpus contained 90 top-down signs (10.64%) and 756 bottom-up signs (89.36%). In this study, top-down governance refers only to recurrent patterns observable in institutionally managed signage. It does not

refer to the intentions of individual officials or imply that authorship independently causes a particular linguistic form. Bottom-up practices is used in the same restricted sense to describe recurrent patterns among privately produced signs.

3.4 Coding Procedure

The photographic corpus was manually coded and organized in a spreadsheet for statistical analysis, with Python used to assist data management and checking. Coding focused first on observable sign-level features rather than assigning each variable exclusively to an informational or symbolic category. Six dimensions were retained for analysis: language repertoire, spatial arrangement, multilingual information relation, code priority, script form, and Chinese linguistic variants. These dimensions were subsequently interpreted through the informational and symbolic perspectives outlined in Section 2. The two layers therefore guide interpretation rather than functioning as mutually exclusive coding categories.

Language repertoire was recorded through language count and language combination. Code priority was operationalized through the visually dominant language on each sign. For signs containing more than one language, spatial arrangement recorded the relative organization of linguistic codes within the sign, including top to bottom, left to right, centre-surround, and other configurations. This variable refers to intra-sign spatial organization rather than the physical emplacement of the sign. Multilingual information relations were classified according to Reh's categories of duplicating, fragmentary, overlapping, and complementary writing [20]. Script form distinguished simplified, traditional, and mixed Chinese characters, while Chinese linguistic variants recorded the presence of Pinyin, dialectal forms, or combinations of the two.

Variables were analyzed only where they were structurally applicable. Spatial arrangement was applicable to the 385 signs containing more than one language. Valid multilingual information relations were available for 381 of these signs. Script form was analyzed for 767 signs with valid Chinese-script coding, while Chinese linguistic variants were assessed across 775 signs containing Chinese. Seventy-four of these signs contained Pinyin, dialectal forms, or a combination of the two. Values that were structurally inapplicable or could not be coded reliably were treated as missing rather than as substantive categories.

3.5 Data Analysis

Frequencies and percentages were first used to describe the distribution of linguistic and sign-level features across the corpus. Differences between top-down and bottom-up signs were then examined using contingency tables and Pearson's chi-square tests. Cramér's V was reported to indicate the strength of each association. When sparse cell counts made the chi-square approximation unreliable, Fisher's exact test or a Monte Carlo exact procedure was used as appropriate. Because seven primary comparisons were conducted, p values were adjusted using the Holm procedure.

Authorship was strongly associated with visual sign type in the corpus. The observed differences were therefore

interpreted as associations within the signage system rather than as independent effects of authorship. A sensitivity analysis restricted to signboards was conducted where sufficient cases were available to assess whether the main patterns remained when sign type was more closely controlled.

Selected signs were also examined qualitatively to illustrate how the recurrent quantitative patterns appeared in individual cases. These examples supported the interpretation of language priority, spatial arrangement, linguistic form, and multilingual information distribution, but were not used to estimate prevalence or infer the intentions of sign producers.

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4. Results

The 846 signs reveal a linguistic landscape dominated by Chinese but differentiated sharply by sign authorship. The results first establish the overall language profile and then examine how top-down and bottom-up signs differ in language choice and geosemiotic configuration.

4.1 Overall Linguistic Landscape

More than half of the corpus was monolingual (54.49%), while bilingual signs accounted for 37.94% and signs containing three or more languages for 7.57%. Two language configurations formed the core of the landscape: Chinese-only signs represented 46.10% of the corpus, and Chinese-English signs accounted for a further 37.94% (Table 1). Together, these two configurations comprised 84.04% of all signs. English-only signs were much less frequent (8.39%), while Japanese and Korean appeared almost entirely as additional languages on multilingual signs. The overall profile can therefore be described as strongly Chinese-centred, with Chinese-English bilingualism forming the principal multilingual pattern.

Table 1: Overall language profile of the sign corpus (N = 846)

Language profile	Category	n	%
Language count	Monolingual	461	54.49
	Bilingual	321	37.94
	Multilingual	64	7.57
	Chinese only	390	46.10
Language combination	Chinese-English	321	37.94
	English only	71	8.39
	Chinese-English-Japanese-Korean	63	7.45
	Chinese-English-Korean	1	0.12

4.2 Language Choice by Sign Authorship

The clearest authorship difference concerned language repertoire (Figure 2). Two thirds of the top-down signs were multilingual (66.67%), compared with only 0.53% of the bottom-up signs. Bottom-up signage was instead concentrated in monolingual (59.79%) and bilingual (39.68%) forms. The association between authorship and language count was

statistically significant, $\chi^2(2, N = 846) = 507.28$, $p_{\text{Holm}} < 0.001$, with Cramér's $V = 0.774$. Relative to the other features examined in this study, this value indicates a particularly pronounced association between sign authorship and the number of languages displayed.

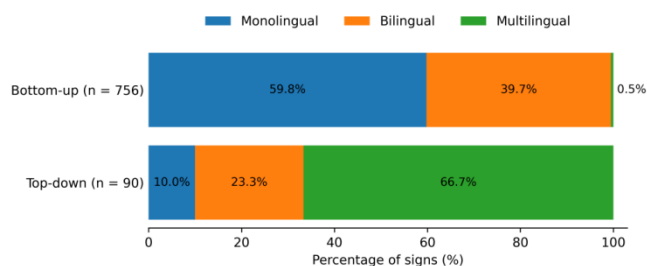


Figure 3: Distribution of language patterns by sign authorship

The language-combination analysis clarifies what produced this repertoire difference. All 60 multilingual top-down signs used Chinese, English, Japanese, and Korean, whereas bottom-up signs were concentrated in Chinese-only (50.40%) and Chinese-English (39.68%) configurations. English-only signs occurred exclusively in the bottom-up subset. The association between authorship and language combination was similarly pronounced, $\chi^2(3, N = 846) = 507.62$, $p_{\text{Holm}} < 0.001$, $V = 0.775$. Because language count and language combination describe closely related aspects of repertoire structure, the latter result specifies the composition of the broader repertoire difference rather than representing a separate independent effect.

A different pattern emerged for visual code priority. Chinese was dominant in 98.89% of top-down signs and 86.38% of bottom-up signs, while English dominance occurred in 13.62% of the bottom-up corpus but in only one top-down sign. The association was statistically significant, $\chi^2(1, N = 846) = 11.68$, $p_{\text{Holm}} = 0.0019$, but Cramér's V was only 0.117. In substantive terms, authorship was much more strongly related to how many languages were displayed than to which language occupied the dominant visual position. Chinese remained the principal code in both sectors of the landscape.

4.3 Spatial, Informational, and Linguistic Configuration

Authorship differences were also visible in the spatial organization of multilingual signs. Among the 385 signs for which spatial arrangement was applicable, 96.30% of

top-down signs used a vertical, top-to-bottom organization,

Table 2: Distribution of language patterns by sign authorship

Dimension	Feature	Main distributional contrast	N	$\chi^2(\text{df})$	Holm-adjusted p	Cramér's V
Language repertoire and hierarchy	Language count	Multilingual: TD 66.67%; BU 0.53%	846	507.28 (2)	< 0.001	0.774
	Language combination	TD mainly C-E-J-K; BU mainly C only and C-E	846	507.62 (3)	< 0.001	0.775
	Dominant code	Chinese dominant: TD 98.89%; BU 86.38%	846	11.68 (1)	0.002	0.117
Spatial and informational organization	Spatial arrangement	Vertical: TD 96.30%; BU 72.70%	385	20.70 (3)	< 0.001	0.232
	Information relation	Duplicating: TD 97.53%; BU 72.00%	381	23.86 (3)	< 0.001	0.250
Script and linguistic form	Script form	Simplified Chinese: TD 96.67%; BU 92.02%	767	2.49 (2)	0.288	0.057
	Chinese variants	Present: TD 0%; BU 10.80%	775	10.75 (1)	0.002	0.118

Note: TD = top-down; BU = bottom-up; C = Chinese; E = English; J = Japanese; K = Korean. Percentages are calculated within authorship categories. The p column reports Holm-adjusted p values for the seven primary Pearson chi-square tests. Exact procedures (Monte Carlo or Fisher's exact, as appropriate) were used as robustness checks for selected tables and are reported in the text. Denominators vary according to the structural applicability and valid coding of each feature.

compared with 72.70% of bottom-up signs. Horizontal, left-to-right arrangements occurred in 21.38% of bottom-up signs but only 3.70% of top-down signs, while centre-surround and other configurations appeared only in the bottom-up subset. The association was statistically significant, $\chi^2(3, N = 385) = 20.70$, $p_{\text{Holm}} < 0.001$, $V = 0.232$, and the conclusion was unchanged in the Monte Carlo exact check. The result points to greater spatial regularity in top-down multilingual signage, whereas bottom-up signs used a wider range of internal layouts.

The distribution of information across languages showed a related but distinct pattern. Duplicating relations accounted for 97.53% of valid top-down multilingual signs, indicating that the languages displayed usually carried broadly equivalent information. The corresponding proportion among bottom-up signs was 72.00%. The remaining 28.00% of bottom-up cases consisted of fragmentary (11.00%), complementary (11.33%), and overlapping relations (5.67%). Authorship was significantly associated with multilingual information relation, $\chi^2(3, N = 381) = 23.86$, $p_{\text{Holm}} < 0.001$, $V = 0.250$, with the Monte Carlo exact procedure supporting the same conclusion. Top-down multilingualism was therefore characterized by a high degree of informational repetition, whereas bottom-up multilingual signs showed greater variation in how content was distributed across languages.

Script form did not show a comparable authorship difference. Simplified Chinese predominated in both groups, accounting for 96.67% of top-down signs and 92.02% of bottom-up signs with valid script coding. The association was not statistically reliable, $\chi^2(2, N = 767) = 2.49$, $p_{\text{Holm}} = 0.288$, $V = 0.057$; the Monte Carlo exact test likewise produced a non-significant result ($p = 0.410$). Script form therefore appears to be a broadly shared feature of the site rather than a meaningful point of differentiation between the two actor groups.

Chinese linguistic variants showed a more localized difference. Pinyin, dialectal forms, or combinations of the two occurred in 74 bottom-up signs (10.80%) but in no top-down signs. The association was statistically significant, $\chi^2(1, N = 775) = 10.75$, $p_{\text{Holm}} = 0.0021$, $V = 0.118$, with Fisher's exact test supporting the same conclusion. The modest association is important for interpretation: these forms distinguish a subset of bottom-up signs but do not characterize the commercial landscape as a whole.

At sign level, selected examples illustrate the configurations identified in the quantitative analysis (Figure 4). Figure 4a shows a top-down multilingual public-information sign in which Chinese occupies the most prominent position within a regular multilingual arrangement. Figure 4b represents a common bottom-up bilingual configuration, with Chinese retaining visual priority alongside English. Figure 4c illustrates a less common but analytically relevant commercial configuration in which English receives greater visual prominence. Taken together, the three examples show both the recurrent contrast between institutional and commercial signage and the greater internal variation found among bottom-up signs. The examples are illustrative rather than evidence of prevalence; their broader informational and symbolic implications are considered in Section 5.



(a) Top-down multilingual public-information sign



(b) Chinese-centred bilingual commercial sign



(c) English-prominent commercial sign

Figure 4: Sign Configurations by Authorship

One qualification is necessary when interpreting these actor differences. Authorship was strongly associated with visual sign type in the corpus: public notices accounted for 82.22% of top-down signs, whereas signboards accounted for 74.60% of bottom-up signs. All 60 multilingual top-down signs were public notices. Some of the full-corpus contrast may therefore reflect differences in what the two sectors use signs for rather than authorship alone.

To examine this possibility, the analysis was repeated for signboards only ($N = 579$), the sign type with sufficient representation in both actor categories. The association between authorship and language count remained significant, but its magnitude decreased substantially from $V = 0.774$ in the full corpus to $V = 0.117$ in the signboard subset (Monte Carlo $p = 0.021$). The difference in dominant code was no longer significant (Fisher's exact $p = 0.709$, $V = 0.037$). The full-corpus patterns therefore characterize the organization of the observed signage system, but part of their magnitude is linked to the different functional composition of top-down and bottom-up signs.

5. Discussion

The main contribution of the analysis lies in separating multilingual visibility from the ways in which multilingual resources are organized. Top-down and bottom-up signs differed not only in the number and combination of languages displayed, but also in how information, visual priority, and localized linguistic resources were distributed across those languages. These differences, however, cannot be attributed to authorship alone because the two actor groups also performed different sign functions within the site. The discussion therefore considers the informational and symbolic implications of the observed configurations before returning to the relationship between authorship and sign function.

5.1 Informational Functions: Selection, Distribution, and Information Relations

The informational findings show why the number of languages on a sign should be distinguished from the information made available through those languages. Top-down signage displayed a broader multilingual repertoire, most visibly through the recurrent use of Chinese, English, Japanese, and Korean. Yet this multilingual expansion was accompanied by highly regular information relations: almost all valid top-down multilingual signs reproduced broadly equivalent content across languages. Bottom-up signs generally used fewer languages, but multilingual commercial signs showed greater variation in how content was divided among them. The contrast is therefore one of informational organization as well as linguistic repertoire.

This distinction extends the informational function proposed by Landry and Bourhis [1] by separating linguistic availability from information equivalence. Reh's typology is particularly useful here because duplicating, fragmentary, overlapping, and complementary relations identify what co-present languages actually contribute to a sign [20]. A four-language sign may offer similar information four times, while a bilingual sign may assign different information to each language. In the Grand Tang Mall, the concentration of

duplicating relations in top-down signage suggests that institutional multilingualism primarily broadens the linguistic reach of public information. This interpretation is compatible with findings from tourism settings in which institutionally produced signs show greater multilingual standardization [18] and with recent research in Xi'an documenting the coexistence of Chinese dominance and foreign-language provision for tourism communication [6]. The present study adds a within-site qualification: greater multilingual visibility does not necessarily imply greater differentiation of information.

Bottom-up multilingualism followed a less uniform pattern. Fragmentary, complementary, and overlapping relations occurred more often in commercial signs, indicating that Chinese and English did not always perform equivalent informational work. This does not make bottom-up signs intrinsically less informative. Rather, information was more selectively distributed across codes. Such patterns are consistent with tourism research showing that foreign languages may combine communicative value with commercial or symbolic functions [9], [10], [19]. For linguistic landscape analysis, the implication is that language presence should be considered together with the amount and type of information assigned to each language.

Spatial arrangement adds a further dimension to this informational organization. Top-down multilingual signs were strongly concentrated in a vertical format, while bottom-up signs used a wider range of internal layouts. The present study cannot determine whether one arrangement improves comprehension or readability, because audience responses were not measured. What the data do show is a higher degree of formal regularity in institutionally managed multilingual signs. Geosemiotics treats the spatial organization and relative priority of discourse as meaningful aspects of sign configuration [2], while recent tourism research likewise shows that multilingual prominence varies with authorship and spatial function [19]. At the Grand Tang Mall, multilingual provision is therefore organized through recurrent conventions of language selection, information equivalence, and spatial presentation.

5.2 Symbolic Functions: Power, Identity, and Ideology

The most consistent symbolic pattern is the continued visual priority of Chinese. Chinese was dominant in almost all top-down signs and remained the principal visual code in most bottom-up signs, despite the greater occurrence of English prominence in the latter. The landscape is therefore multilingual without being visually symmetrical. From a geosemiotic perspective, linguistic hierarchy is expressed through recurrent code preference and visual prominence rather than through language presence alone [2]. Similar patterns have been reported in recent research on Chinese tourism and urban linguistic landscapes, where English may index international orientation while Chinese retains its central position in public communication [6], [17]. In the Grand Tang Mall, the visibility of foreign languages therefore operates within a broadly Chinese-centred linguistic order.

Within this shared hierarchy, bottom-up signage provides a wider range of symbolic resources. Figure 5 brings together

three examples that illustrate this variation: a Tang-related cultural reference, an English global-brand display, and a dialectal local expression. These examples should not be treated as equally prevalent features of the commercial landscape. Rather, they show how different linguistic resources become available for different forms of cultural and commercial positioning.



(a) Tang-related cultural reference



(b) English global-brand display



(c) Dialectal local expression

Figure 5: Symbolic Resources in Bottom-up Signs

English is especially relevant in this respect. Some bottom-up signs give English substantial visual prominence, while global-brand displays may use English independently of multilingual public-service translation (Figure 5b). Research on commercialized heritage environments has similarly shown that English can introduce an international or contemporary orientation alongside historically marked

Chinese resources [10]. Shang further relates the public visibility of English in China to discourses of internationalization [17]. English prominence in the Grand Tang Mall can therefore be read as one available resource of global and commercial indexicality. This interpretation concerns the patterned semiotic value available to English in the landscape; it does not establish the intentions of individual businesses.

Localized resources operate differently. Tang-related expressions and dialectal forms such as Fangha make historical and local associations visible within the commercial landscape (Figure 5a, c). Comparable studies of Chinese heritage destinations show that localized language, traditional cultural references, and historically marked forms may participate in the semiotic construction of place and heritage [10]-[12], [14]. Such forms were nevertheless limited to a minority of bottom-up signs in the present corpus. Their significance lies in their salience as locally marked resources rather than in their numerical dominance.

This heritage reading also requires caution. Recent work shows that linguistic and cultural resources in tourism spaces can be stylized, commodified, and recontextualized for visitor consumption [10]-[12]. Zhang and Xie, for example, demonstrate that heritage-related scripts may acquire spectacle value partly detached from their original communicative functions [12]. Tang references and dialectal expressions at the Grand Tang Mall should therefore not be taken as direct evidence of cultural authenticity. They are better understood as semiotic resources through which locality and historical orientation are made visible in a commercial tourism environment.

Institutional language ordering provides the clearest basis for discussing ideology. During the 2024 fieldwork, the version of China's Law on the Standard Spoken and Written Chinese Language then in force established standardized Chinese as the basic written form in public-service contexts [26]. The strong visual priority of Chinese and the formal regularity of top-down signage are compatible with this regulatory environment. Research in China has likewise shown that institutionally controlled signs are particularly responsive to language-policy intervention [27], while Shang connects top-down bilingualism with standard-language ideology and internationalization discourse [17]. The evidence from the Grand Tang Mall therefore supports an interpretation of top-down signage as displaying institutionalized language ordering. It does not, however, permit claims about the subjective intentions of individual officials or sign producers.

5.3 Sign Authorship and Differentiated Semiotic Practices

Taken together, the results show that top-down and bottom-up signs are associated with different configurations of linguistic resources. Top-down signs combine broader multilingual repertoires with highly regular information relations and spatial arrangements. Bottom-up signs use a narrower repertoire overall but show greater variation in language combination, information distribution, spatial organization, English prominence, and localized linguistic forms. These patterns are consistent with the established distinction between institutional and private actors in the production of

public language [4], [15], [16]. They also support more recent geosemiotic work showing that actor differences become visible through the organization of signs as well as through language frequency [5], [19].

Authorship, however, is only part of this relationship. In the present corpus, institutional signage consists mainly of public-information signs, whereas privately produced signage is dominated by commercial signboards. The signboard-only sensitivity analysis substantially reduced the association between authorship and language count, and the difference in dominant code was no longer significant. The large contrasts observed in the full corpus therefore reflect the organization of two differently composed sign systems as well as authorship itself. This qualification is theoretically important because sign producers do not enter the landscape independently of communicative function. Institutional actors are more often responsible for public guidance and service information, while commercial actors produce signs serving promotional and branding purposes. Authorship and sign function should therefore be treated as related dimensions of linguistic landscape organization rather than as competing explanations.

This relational interpretation extends recent work on Xi'an. Ai, Yang, and Wang show that tourism language practices across the city articulate cultural pride and tourism-oriented profit [6]. The present findings locate a related distinction within a single tourism district. Cultural, local, and international orientations are not distributed evenly across the Grand Tang Mall. They become visible through particular combinations of actor position, sign function, linguistic repertoire, information structure, and visual priority. Zhang and Zhang's account of agency and institutional structure similarly suggests that linguistic landscape patterns emerge through the interaction of social position and situated practice rather than through either dimension alone [5]. The Grand Tang Mall provides quantitative evidence of how such relations are materialized at the level of individual signs.

The findings can consequently be organized through an actor–configuration–function sequence. Authorship identifies the institutional position from which a sign enters the landscape. Observable configuration describes how linguistic resources are selected, prioritized, spatially arranged, and distributed across languages. Informational and symbolic interpretation then addresses what these recurrent configurations make available or salient in the tourism space. This sequence is intended as an analytical organization of the evidence rather than as a new causal model. Its value lies in preventing actor labels from becoming explanations in themselves while also moving linguistic landscape analysis beyond simple counts of language presence. In the Grand Tang Mall, the relationship between governance and bottom-up practice is most clearly visible in the organization of multilingual information, formal regularity, linguistic hierarchy, and the selective use of global, historical, and local resources.

6. Conclusion

This study examined how top-down and bottom-up signs differ in their use and organization of linguistic resources in Xi'an's Grand Tang Mall, and how these differences

contribute to the informational and symbolic organization of the tourism linguistic landscape. The findings show that authorship is associated with recurrent differences in language repertoire, information distribution, spatial arrangement, and linguistic form, although these patterns are also shaped by the different functions performed by institutional and commercial signs.

6.1 Main Findings

Regarding the first research question, the two actor groups showed distinct patterns of linguistic organization. Top-down signage was characterized by broader multilingual repertoires, highly regular spatial arrangements, and predominantly duplicating information across languages. Bottom-up signage used fewer languages on average but displayed greater variation in language combination, information distribution, visual priority, and localized linguistic resources. Chinese nevertheless remained the principal visual code across both sectors.

The second research question concerned what these differences mean functionally. At the informational level, the study distinguishes multilingual availability from information equivalence. A sign may display more languages without providing more differentiated information, as shown by the strong concentration of duplicating relations in top-down multilingual signage. At the symbolic level, Chinese visual priority establishes a relatively stable linguistic hierarchy, while English prominence, Tang-related references, and dialectal expressions provide more selective resources for global, historical, and local positioning. These meanings arise from the way linguistic resources are combined with visual priority, spatial organization, and cultural context rather than from language presence alone.

The broader contribution lies in connecting authorship with observable sign configuration before moving to functional interpretation. The proposed actor–configuration–function sequence treats authorship as an institutional position rather than as an explanation in itself. This is particularly important because the sensitivity analysis showed that authorship and sign function are closely intertwined. The pronounced full-corpus contrasts partly reflect the fact that top-down signs are dominated by public-information functions, while bottom-up signs are dominated by commercial signboards. The findings should therefore be understood as patterns in the organization of the Grand Tang Mall signage system, not as independent causal effects of authorship.

6.2 Practical Implications

For tourism-space management, the findings suggest that multilingual planning should consider how information is distributed across languages rather than treating language number as the sole indicator of multilingual provision. Public-information signs at the Grand Tang Mall already display broad multilingual coverage and considerable formal regularity. Future signage assessment could therefore examine content equivalence, terminological consistency, and visual presentation together, particularly across connected wayfinding and public-service systems. These issues were not directly evaluated in the present study, but the observed

variation in information relations indicates why multilingual provision should be assessed at the level of content as well as language presence.

Commercial signage calls for a different balance. Its greater variation in linguistic and visual form contributes to the semiotic diversity of the tourism district, particularly through global-brand English, local expressions, and culturally marked references. Management of commercial signage need not seek the same degree of formal uniformity found in public-information systems. Where regulation is necessary for public-facing information, attention can be directed to clarity and consistency while leaving room for linguistic and cultural variation in commercial expression. In heritage tourism settings, this distinction may help maintain coherent public information without removing the localized resources that give the commercial landscape its cultural specificity.

6.3 Limitations and Future Research

Several limitations define the scope of the findings. First, the corpus represents one tourism-commercial district and one period of fieldwork between January and March 2024. The findings therefore characterize the Grand Tang Mall rather than Xi'an as a whole, and they cannot capture seasonal or longer-term changes in the landscape. Comparative studies across heritage sites, commercial tourism streets, residential areas, and other public spaces would help determine which patterns are site-specific and which recur across different urban settings.

Second, the analysis is based on observable signs and cannot establish how sign producers intended particular linguistic choices or how visitors actually understood them. Interviews with institutional and commercial sign producers could test the interpretations of governance, standardization, commercial differentiation, and identity indexing proposed here. Visitor surveys, interviews, or experimental methods such as eye tracking could separately examine comprehension, attention, perceived authenticity, and responses to multilingual configurations. Such reception research would extend the present sign-centred analysis rather than serve as evidence retrospectively attributed to the current corpus.

Finally, the study focused on relatively stable physical signs and did not systematically include dynamic digital displays, interactive screens, temporary installations, or digitally mediated tourism communication. These increasingly form part of contemporary tourism semiotic environments and may alter both the temporal stability of linguistic landscapes and the relationship between institutional and commercial communication. Future research should therefore examine linguistic landscapes across physical and digital interfaces, while retaining clear distinctions among sign production, visual configuration, and audience reception.

The Grand Tang Mall illustrates how a tourism linguistic landscape can remain strongly Chinese-centred while accommodating multilingual communication, institutional regulation, commercial differentiation, and localized cultural expression. Its linguistic diversity is organized through patterned differences in authorship, information structure, and spatial configuration. Examining these relationships together

provides a more precise account of how language becomes both communicative infrastructure and symbolic resource in heritage-oriented tourism space.

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