

Geospatial documentation of affective perceptions toward multilingual signage in Baubau's heritage tourism landscape

 Sukur Oda^{1*},  Akin Duli²,  Lukman³

¹Doctoral Program in Linguistics, Postgraduate Faculty of Cultural Sciences, Hasanuddin University, Makassar, Indonesia; syukur.oda@gmail.com (S.O.).

²Department of Archaeology, Postgraduate Faculty of Cultural Sciences, Hasanuddin University, Makassar, Indonesia; akinduli@unhas.ac.id (A.D.).

³Doctoral Program in Linguistics, Postgraduate Faculty of Cultural Sciences, Hasanuddin University, Makassar, Indonesia; lukman_1212@yahoo.co.id (L.).

Abstract: This study examines tourists' affective perceptions of multilingual public signage in Baubau's heritage tourism landscape and how different language choices shape their engagement with the place. A semantic differential (SD) survey was distributed to 204 domestic and international visitors, who evaluated photographic stimuli representing Wolio (indigenous), Indonesian, English, and mixed-language signage across the dimensions of Evaluation, Potency, and Activity on a 7-point bipolar scale. Geospatial documentation of signage locations was incorporated to contextualise these perceptual responses within the physical tourism landscape. The results show a consistent descriptive trend in which Wolio signage received the highest mean rating ($M = 1.98$), followed by Indonesian ($M = 1.88$) and mixed-language signs ($M = 1.78$), while English received the lowest rating ($M = 1.50$). Although the repeated-measures ANOVA produced a marginal p-value (0.059), the overall trend suggests that indigenous and national languages elicit stronger emotional engagement from visitors than the global lingua franca. These findings underscore the symbolic and cultural value of Wolio and Indonesian in shaping the visitor experience, enhancing practical insights for planning multilingual signage, destination branding, and culturally sustainable tourism communication.

Keywords: *Applied communication, Geospatial documentation, Heritage tourism, Multilingual signage, Semantic differential, Tourist perception.*

1. Introduction

Public language displays in heritage tourism form a primary site for negotiating between cultural authenticity and international accessibility. This negotiation shapes both visitor wayfinding and symbolic communication, directly influencing tourists' emotional connection to the place. Environmental psychology models of visitor experience proposed by Beattie and Ellis [1] highlight that these affective responses play a central role in visitor satisfaction and the construction of meaning within tourism environments. Despite this, empirical research examining tourists' emotional perceptions of linguistic landscapes remains limited, particularly in non-Western heritage contexts where multilingual displays intersect more directly with issues of identity, authenticity, and cultural representation. As technology advances, understanding these perceptual patterns is crucial for designing multilingual systems that support navigation and cultural interpretation.

This study addresses that gap by focusing on Baubau City, a destination distinguished by its rich and multifaceted tourism landscape in Southeast Sulawesi Province, Indonesia. The city's significance as a research setting is centered on the Buton Royal Fortress, a primary tourism icon designated as a National Cultural Heritage in 2006. International recognition, including acknowledgment from Guinness World Records as the world's largest fortress, has attracted numerous domestic and

international visitors, making it a significant case study. Baubau offers a linguistically rich environment where the indigenous Wolio language (with its traditional Buri Wolio script), the national language (Indonesian), and English as a global lingua franca coexist within the same visual space [2]. The city's tourism landscape presents a unique setting where linguistic diversity visually embodies the intersection of heritage, modernity, and globalization. Understanding how tourists emotionally respond to these multilingual encounters is crucial for developing tourism strategies that preserve local identity while remaining accessible to international audiences. This need is particularly acute as destinations seek more systematic approaches to managing multilingual information.

Linguistic signs in tourism areas are far from neutral. Their design, language choice, and visibility reflect broader sociocultural and political dynamics. As noted by Leschziner and Brett [3] and Hunter [4], public signage simultaneously regulates behavior and conveys symbolic messages tied to social hierarchies and power structures. In this sense, the linguistic landscape becomes not merely a reflection of language use but a communicative space through which social meanings, values, and ideologies are visually negotiated. Previous research by Cenoz and Gorter [5] and Gorter et al. [6] also highlights its pedagogical potential as an informal arena for language awareness, intercultural understanding, and the appreciation of linguistic diversity. These perspectives underscore the need for analytical models that can integrate visual language patterns with quantifiable psychological responses, supporting more rigorous and evidence-informed approaches to communication design in tourism contexts.

The field of linguistic landscape (LL) studies broadly investigates how multiple languages coexist and interact within public and commercial signage [7, 8]. Scholars such as Ben-Rafael et al. [9] argue that LL research serves two main goals: identifying consistent patterns in the visibility and hierarchy of languages in public spaces and understanding the motivations and perceptions that guide language choice. However, while much scholarship has examined the sociological and ideological dimensions of LL, relatively few studies have quantified the psychological and affective aspects of how visitors perceive multilingual signs. The present study draws upon the sociopsychological tradition [10–12] to address this gap and extend it into an applied research direction relevant to tourism communication systems, urban geospatial planning, and user-centered signage design.

Within this framework, Charles Osgood's Semantic Differential (SD) theory offers a valuable analytical tool for linking linguistic form and affective meaning. Osgood [13] and Osgood [14] proposed that individuals interpret stimuli, such as words, symbols, or images, through internal psychological responses structured along three fundamental dimensions: Evaluation (*good–bad*), Potency (*strong–weak*), and Activity (*active–passive*). These dimensions capture the affective and connotative meanings assigned to stimuli, allowing researchers to map how language evokes emotional associations. Although initially developed to study verbal meaning, the SD scale has since been successfully applied to nonverbal and visual domains, such as in studies by Hawkes et al. [15], Khan [16], Vigneron and Johnson [17] and Richter and Hütter [18], demonstrating its flexibility in measuring human perceptions beyond linguistic content, the SD framework, when combined with geospatial documentation of signage distribution, holds potential as a methodological tool for analyzing multilingual information systems in tourism environments.

In the context of Baubau's linguistic landscape, the SD approach enables an empirical assessment of how different language categories are emotionally processed by visitors. Here, authenticity is operationalized as the perceived genuineness and cultural integrity of local representation, as reflected in attitudes toward the Wolio language. A high evaluative score for Wolio signage, for example, would suggest that tourists associate it with authenticity and heritage, while a lower score for English might imply a perception of global accessibility but reduced cultural depth. These perceptual patterns provide essential input for designing signage systems that balance cultural sustainability with functional efficiency, particularly as heritage destinations adopt more structured multilingual information management practices.

Despite its broad application in fields ranging from psychology to design and communication, Osgood's SD theory has rarely been applied to the study of linguistic landscapes or tourism

communication. This absence presents a meaningful research opportunity. By introducing SD-based measurement into LL analysis, this study develops a novel analytical perspective for examining how visitors emotionally interpret multilingual environments. We were particularly interested in examining how languages at the local, national, and global levels function symbolically in shaping tourists' emotional connections to place and how these insights can support more informed multilingual communication strategies in tourism settings.

Our approach examines these linguistic encounters from a sociopsychological perspective, building on Osgood's foundational work while extending it into new terrain. This research is guided by two primary questions informed by our deep review of the literature and observations of the current tourism communication landscape:

1. How do tourist perceptions of multilingual signage in Baubau City's public tourism spaces vary across the three core dimensions of Osgood's semantic differential theory: evaluation, potency, and activity?
2. How do tourists' reflections on multilingual signage indicate potential for informal language awareness in heritage tourism contexts?

Based on prior literature linking language choice with authenticity and identity [5, 19], we hypothesize that tourists' perceptions will vary significantly across language categories, with Wolio expected to receive more positive evaluative ratings due to its symbolic link with local culture. This exploratory approach not only tests the applicability of Osgood's theory in a novel setting but also provides practical implications for heritage-based language management, geospatially organized signage systems, and more informed strategies for multilingual communication in heritage destinations such as Baubau City.

2. Literature Review

2.1. Linguistic Landscape: From Representation to Perception

The study of the linguistic landscape (LL) originates from the foundational work of Landry and Bourhis [7], who defined it as the collection of languages displayed on public road signs, advertisements, street names, and official buildings. Their definition established LL as an analytical lens for understanding how visible language both reflects existing social structures and contributes to the construction of social realities. Building on this foundation, Scollon and Scollon [20] developed the *geosemiotics* framework, which highlights the spatial, material, and social meanings embedded in the physical placement of linguistic signs. Their introduction of the concept of *code preference* further demonstrates how bilingual and multilingual signage choices are shaped by sociocultural hierarchies, language ideologies, and power relations. Together, these frameworks provide the conceptual basis for examining LL not merely as text in space, but as a socially and politically situated semiotic system.

Subsequent research expanded LL inquiry beyond linguistic visibility toward a broader multimodal understanding of communication. Scholars such as Kress and Van Leeuwen [21] visual elements, such as color, font, size, composition, and layout, function as a *visual grammar* that contributes to meaning-making. Applying this multimodal perspective allows researchers to investigate how visual design interacts with linguistic choices, producing layered interpretations of authority, modernity, cultural authenticity, or commercial intent. In tourism settings, these semiotic cues play a critical role in shaping how visitors perceive and emotionally evaluate a place. Even though this theoretical expansion, much of LL research remains predominantly descriptive, documenting patterns of language presence without systematically examining how signs are experienced or interpreted by readers. The present study addresses this gap by analyzing the affective and perceptual dimensions of LL interpretation using Osgood's Semantic Differential framework, complemented by geospatial documentation of signage distribution to support applied communication analysis in tourism environments.

2.2. Language and Tourism: Authenticity, Identity, and Marketability

The intersection of language and tourism has long been recognized as a central site for negotiating

identity and authenticity [22]. Within this field, language serves a dual function, both as a means of communication and as a symbolic marker of local identity. This duality becomes particularly salient in the tourism linguistic landscape, where language choice operates simultaneously as an informational device and a cultural signal. In many destinations, minority or heritage languages are used to convey authenticity for visitors seeking culturally grounded experiences, while global languages such as English are used to enhance accessibility.

This dynamic has been observed in diverse cultural settings. Research conducted in Ireland [23], Spain [24], Thailand [25], the United Arab Emirates [26], Singapore [27], and Tanzania [28] demonstrates that language visibility in tourism spaces reflects broader ideological and economic processes. Despite the breadth of this research, relatively few studies have examined how tourists psychologically interpret multilingual signs.

Indonesia presents a valuable context in this regard. Recent studies in Bali [29, 30], Kupang [31, 32], Malang [33], Magelang [34], and Timor Tengah Selatan [35] reveal that as tourism expands into peripheral regions, local communities often reframe their linguistic resources as cultural capital. What remains underexplored is how tourists perceive and emotionally engage with these languages as indicators of authenticity or a sense of inclusion.

By focusing on Baubau City, where Wolio, Indonesian, and English coexist, this study seeks to empirically link the linguistic display of heritage with tourists' affective and evaluative responses. Incorporating geospatially captured signage data further situates this inquiry within practice-oriented communication research relevant to contemporary tourism planning.

2.3. Linguistic Landscape as Pedagogical Space

Beyond its communicative function, the linguistic landscape has increasingly been recognized as a pedagogical resource that fosters informal language learning. Scholars argue that public signs function as authentic input, connecting learners with language use in real-world contexts [36, 37]. Exposure to multilingual environments encourages reflection on linguistic diversity and supports the development of awareness and empathy toward other languages and cultures [19, 38].

Recent studies by Malinowski et al. [39], Krompák et al. [40], and Gorter et al. [6] further position the LL as a tool for language awareness and intercultural competence, emphasizing its educational potential in both formal and informal settings. However, most of this research has been conducted in classroom-based or urban educational contexts. In tourism environments, where encounters with language are brief, incidental, and not guided by structured learning objectives, the pedagogical role of the LL remains largely conceptual.

To address this gap, the present study employs Osgood's Semantic Differential theory [13, 14] as its central analytical framework for examining how tourists emotionally interpret multilingual signage. The SD model provides a systematic means of quantifying affective meaning along the dimensions of evaluation, potency, and activity, thereby allowing the study to measure the connotative and psychological responses elicited by different language forms. By translating these dimensions into measurable variables, the study examines whether engaging emotionally with local and national languages fosters greater cultural appreciation and facilitates incidental learning in tourism settings. This theoretical orientation corresponds with contemporary trends in practice-oriented communication research, where affective and user-centered insights are increasingly used to inform the refinement of physical and digital information systems in tourism environments.

2.4. The Sociopsychological Tradition in Meaning and Attitude Research

The sociopsychological tradition, rooted in communication and social psychology, provides a powerful framework for understanding how individuals interpret and respond to messages within their environment. Theories in this tradition emphasize persuasion, attitude formation, and cognitive processing Mehrabian and Russell [41]. Beattie and Ellis [1] investigate how internal mental states mediate external behavior, offering a means to connect linguistic stimuli to emotional and cognitive

reactions.

Within this tradition, Charles Osgood's contributions stand out for providing an operational mechanism to measure connotative meaning. His Semantic Differential approach translates abstract perceptions into quantifiable dimensions, linking subjective experience with objective measurement. When applied to multilingual signage, this approach enables researchers to analyze how language visibility in public spaces generates affective impressions, such as whether a language appears *authentic*, *powerful*, or *dynamic* to an observer. Thus, the sociopsychological perspective provides a bridge between linguistic form and human perception, aligning well with the present study's aim to examine tourists' emotional and cognitive engagement with linguistic landscapes and to support data-informed communication strategies in heritage tourism.

2.5. Semantic Differential: Measuring Perceptual Meaning

Osgood's Semantic Differential (SD) technique was developed to capture how people associate connotative meaning with stimuli, whether words, symbols, or objects [42-44]. It employs bipolar adjective pairs such as *good-bad*, *strong-weak*, and *active-passive* to measure evaluative tendencies. Factor analysis of these scales consistently reveals three core dimensions of meaning: Evaluation, Potency, and Activity (EPA). Together, they form a metaphorical *semantic space* within which attitudes toward stimuli can be plotted [45, 46]. This technique provides a powerful tool for objectively measuring the subjective and emotional components of meaning.



Figure 1.
Semantic Differential Scale Model.

The semantic differential scale was selected in this research because it provides a standardized method for measuring tourist attitudes toward multilingual signage across multiple psychological dimensions. It is extensively employed in linguistics and social psychology to gauge social attitudes. For LL analysis, the SD scale presents significant benefits. First, it measures both the direction (*positive or negative*) and intensity of reactions, yielding a multidimensional understanding of perception. Second, it allows comparisons across language categories, revealing subtle affective hierarchies. Previous studies have validated the SD's versatility in fields ranging from product design [17] to digital and media communication [18] and user experience [16].

In this study, the SD scale serves as a standardized method for assessing tourist perceptions of multilingual signage in Baubau's heritage sites. By applying Osgood's EPA model, the research operationalizes the psychological impact of language visibility, providing empirical evidence on how visitors perceive local (Wolio), national (Indonesian), and global (English) or mixed codes within the tourism landscape. When combined with geospatially mapped signage patterns, these insights contribute not only to LL scholarship but also to broader discussions on applied communication design, user-centered tourism information systems, and cultural sustainability.

3. Method

3.1. Study Design

This study employed a mixed methods strategy by combining quantitative and qualitative research to provide a richer, more comprehensive analysis [47]. The quantitative component involved a

structured survey to assess tourists' perceptions of multilingual signage in Baubau City, utilizing Osgood's Semantic Differential (SD) framework. This approach facilitated affective evaluation along the dimensions of evaluation, potency, and activity, enabling systematic comparisons between different language categories. The qualitative component employed a phenomenological approach to explore participants' lived experiences with multilingual signage, offering insights into their subjective meanings and emotional responses. By integrating psychometric data with experiential narratives, the mixed-methods strategy supports an interdisciplinary analysis of multilingual communication in tourism contexts, thereby enhancing understanding from multiple perspectives.

3.2. Study Site and Participants

The research was conducted at five prominent tourism sites in Baubau City: Buton Royal Fortress, Nirwana Beach, Batu Sori Tourism Area, Samparona Pine Forest Area, and Kotamara Green City. Site selection was guided by two main criteria: (1) consistently high visitor concentration, and (2) the prominent and clear visibility of multilingual signage, specifically Wolio, Indonesian, English, and mixed-language signs, as documented by Oda et al. [2]. At each location, all visible signage was systematically recorded and catalogued using geospatial tagging to facilitate later analysis of spatial patterns in multilingual information placement.

Participants were recruited using purposive sampling, targeting individuals aged 18 years or older who were able to understand the English-language questionnaire. Participants were eligible for inclusion if they met these criteria. Visitors who declined to provide informed consent or were unable to complete all sections of the instrument were excluded from the dataset. Data collection occurred over a nine-week period. Of the 232 visitors approached, 204 completed the survey (yielding a response rate of 87.9%), with an equal split between domestic ($n=102$) and international ($n=102$) participants.

3.3. Data Collection and Instrument

Data were gathered through an on-site, self-administered survey using a structured questionnaire consisting of 24 bipolar adjective statements (8 items per dimension). The instrument measured tourists' perceptions using the Semantic Differential (SD) scale based on Osgood's theory of semantic space. This approach captured both the direction and intensity of attitudes toward four language categories commonly found in Baubau's tourism landscape: Indonesian, English, Wolio (a regional language), and mixed languages.

To ensure precision, all signage presented to respondents was photographed using a standardized procedure and geospatially referenced, which enables the perceptual responses to be matched with their physical contexts and supports the study's applied geospatial component. All signage photographs were systematically classified into four linguistic categories following a predefined coding protocol. The coding process was reviewed jointly by the research team to maintain consistency, resolve ambiguities, and ensure accuracy in linguistic categorization. All photographs were captured following a controlled protocol using a fixed focal length and a minimum resolution of 300 dpi to preserve textual clarity. Stimuli were cropped to remove extraneous background elements while maintaining the original structure of each sign. The order of stimulus presentation was randomized for each participant to minimize potential ordering effects.

The questionnaire employed a 7-point bipolar scale ranging from -3 (extremely negative) to $+3$ (extremely positive), with 0 representing a neutral midpoint, as summarized in Table 1.

Table 1.
The 7-Point Bipolar Semantic Differential Scale.

Value	Descriptive Label
+3	Extremely positive
+2	Quite positive
+1	Slightly positive
0	Neutral
-1	Slightly negative
-2	Quite negative
-3	Extremely negative

The questionnaire consisted of three main sections. The first section collected demographic information. The second section presented participants with high-resolution photographs of 20 distinct multilingual signs selected from the research sites. These signs were categorized into four linguistic groups: (1) Indonesian-only, (2) English-only, (3) Indonesian–English mixed, and (4) Indigenous–modern combination (Wolio script + national (Indonesian)/global language (English)). Participants evaluated each sign according to Osgood’s three primary dimensions of meaning, as illustrated in Table 2. Items for each dimension were adapted from established SD studies by Viana et al. [46] and Tzeng et al. [44].

Table 2.
Dimensions and Example Bipolar Scales.

Dimension	Sample Bipolar Scales
Evaluation	Pleasant–unpleasant, interesting–boring
Potency	Strong–weak, influential–uninfluential
Activity	Modern–outdated, active–passive

Finally, the third section included open-ended questions inviting participants to share their reflections on Baubau’s linguistic diversity. These responses provided valuable qualitative insights that complemented and contextualized the quantitative findings.

3.4. Data Analysis and Validity

Descriptive statistics were used to summarize perceptual tendencies across all SD dimensions. The four language categories were analyzed using a within-subject design because each respondent evaluated all sign types. A repeated-measures structure was therefore the most appropriate model for capturing intra-individual perceptual variation. Because each respondent evaluated all four language categories, a one-way repeated-measure ANOVA was used to test for differences among mean scores. An independent-samples t-test was used to compare perceptions between domestic and international tourists.

Instrument reliability was assessed using Cronbach’s alpha, with all three dimensions exceeding $\alpha \geq 0.70$. Content validity was established through expert review by three linguists and two tourism specialists. Photographs used as stimuli were pre-screened to ensure accuracy of linguistic categorization, visual consistency, and geospatial precision. This integrated approach strengthens the study’s applied-science contribution by linking psychometric findings with spatial context.

Assumptions for repeated-measures ANOVA were examined to ensure the validity of the inferential results. Normality of residuals was assessed using the Shapiro–Wilk test, while sphericity was evaluated through Mauchly’s test. When sphericity assumptions were violated, Greenhouse–Geisser corrections were applied. Partial eta-squared (η^2) was reported as the effect size, and Bonferroni-adjusted pairwise comparisons were conducted to control for Type I error. A post-hoc power analysis ($1-\beta$) was also performed to evaluate the adequacy of the sample size for detecting medium effects across the four language categories.

4. Results

4.1. Comparative Perceptions of the Linguistic Landscape among Tourists

Based on the sociopsychological framework, this study analyzed tourists' perceptions of multilingual signage across the three core dimensions of the Semantic Differential (SD) model: Evaluation, Potency, and Activity [46]. A total of 204 valid responses were examined to capture how tourists perceive and process different language forms (Wolio, Indonesian, English, and mixed languages) within Baubau's public tourism spaces.

To support the applied dimension of the study, each sign included in the questionnaire was geospatially documented. This allowed perceptual patterns to be viewed in relation to the spatial distribution of signage across the tourism environment. Although not designed as a full geospatial analysis, this step provided contextual information on how language placement may relate to visitor perception.

The SD technique was selected for its ability to measure connotative and affective meanings, offering insight into how individuals internalize linguistic stimuli. The descriptive mean scores for each linguistic category are summarized in Table 3.

Table 3.
Average Perceptual Scores for Each Language Category.

Language Category	Mean Score	Std. Deviation (SD)	Interpretation
Indonesian language	1.88	0.50	Quite Good
English language	1.50	0.60	Slightly Good
Wolio language	1.98	0.46	Quite Good
Mixed language	1.78	0.48	Quite Good

4.1.1. Evaluation Dimension

Tourists' evaluations show an overall positive attitude toward Baubau's multilingual environment. As shown in Table 3, the indigenous Wolio language received the highest mean score ($M = 1.98$, $SD = 0.46$), followed closely by Indonesian ($M = 1.88$, $SD = 0.50$) and mixed-language signs ($M = 1.78$, $SD = 0.48$). English obtained a lower yet positive mean ($M = 1.50$, $SD = 0.60$).

This pattern indicates that although English is recognized as a useful international language, it evokes a weaker emotional connection than the local and national languages. Tourists appear to value the authenticity conveyed by Wolio and the familiarity associated with Indonesian. These findings suggest that the spatial presence of Wolio and Indonesian across heritage sites likely strengthens their evaluative appeal.

4.1.2. Potency Dimension

A similar hierarchy appears in the potency dimension, which reflects perceived strength and influence. Wolio ($M = 1.98$) and Indonesian ($M = 1.88$) received the highest scores, indicating that both are viewed as symbolically prominent within Baubau's signage environment. English scored lower ($M = 1.50$), suggesting a primarily functional rather than symbolic role.

These patterns may be partly shaped by placement: signage featuring Wolio script and Indonesian tends to appear in culturally central and historically significant locations, reinforcing their association with local identity and authority.

4.1.3. Activity Dimension

The activity dimension assesses how dynamic or lively each language appears within the public sphere. Once again, Wolio ($M = 1.98$), Indonesian ($M = 1.88$), and mixed languages ($M = 1.78$) achieved consistently high scores, portraying them as active, living components of the city's communicative landscape. English ($M = 1.50$), while still positive, was perceived as more passive and secondary.

These results suggest that tourists experience Baubau's linguistic environment as vibrant and

culturally expressive, with local and national languages functioning as dynamic carriers of both communication and identity. Although English contributes to accessibility, it plays a less prominent role in shaping the city's perceived cultural vitality. These findings indicate that tourists perceive Baubau's linguistic environment as lively and culturally rich, with local and national languages, particularly Wolio and Indonesian, playing a pivotal role in shaping this dynamic atmosphere.

4.1.4. *Synthesis Across Dimensions*

Across all three dimensions, Wolio, Indonesian, and mixed languages receive consistently higher scores than English. Our results support the argument that local linguistic identity plays a central role in shaping affective responses to place. The spatial presence of these languages across heritage sites likely reinforces their perceived authenticity and cultural relevance.

To determine whether these descriptive tendencies represented statistically meaningful differences, a one-way repeated-measures ANOVA was conducted (Table 4). The p-value of 0.059 falls slightly above the conventional significance threshold, indicating a marginal, but not conclusive, trend. While the inferential results remain tentative, the descriptive hierarchy aligns with theoretical expectations concerning authenticity and cultural embeddedness in multilingual environments.

4.1.5. *Effect of the Indigenous Wolio Language on Visitor Satisfaction*

To further assess whether the differences in tourist perceptions were statistically significant across the four language categories, a one-way repeated-measures analysis of variance (ANOVA) was conducted on the full sample of 204 respondents. The results are presented in Table 4.

Table 4.
One-Way ANOVA Results for Perceptual Scores Across Language Categories.

Source	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	12.115	3	4.038	2.541	0.059
Within Groups	317.920	200	1.590		
Total	330.035	203			

Note: F-values are reported with Greenhouse–Geisser corrections where applicable. η^2 = partial eta-squared.

Although not statistically significant at the 0.05 level, the descriptive trend indicates a clear order of preference: Wolio receives the highest mean score, followed by Indonesian and mixed-language signage, with English rated lowest. This hierarchy is consistent with Osgood's framework, which posits that affective meaning is shaped by cultural and symbolic associations, not merely linguistic comprehension.

Wolio's consistently strong performance suggests that visitors perceive it as authentic and culturally meaningful. Indonesia maintains positive evaluations due to its communicative familiarity and national integrative role. Mixed-language signage is also positively received, suggesting that the blending of languages is perceived as both practical and well-suited to the local context. English, while valued for accessibility, appears less tied to local cultural identity and therefore elicits a weaker emotional response.

Taken together, these results suggest that tourists' perceptions are shaped not solely by linguistic comprehensibility but by deeper psychological and cultural cues. Despite the absence of statistically significant differences at the 95% confidence level, the descriptive trend reveals a meaningful preference for languages that embody locality and cultural authenticity. This underscores the symbolic significance of Wolio and Indonesian, affirming their roles as core markers of cultural identity in Baubau's tourism landscape.

From a practical perspective, these findings imply that heritage-based tourism communication may benefit from prioritizing local and national languages, with English incorporated as a supplementary tool for accessibility rather than cultural representation. This balance supports cultural sustainability while ensuring visitor comprehension.

4.2. Qualitative Insights from Open-Ended Responses

In addition to the quantitative results, the thematic analysis of open-ended responses provided further insight into how tourists emotionally interpret Baubau's multilingual environment. Thematic coding of the open-ended responses identified three dominant categories of perception: cultural pride (47% of responses), accessibility and comprehension (32%), and curiosity-driven interest in learning local language elements (21%). These themes were supported by representative participant quotations that illustrate tourists' affective orientations toward multilingual signage.

4.2.1. Theme 1: Cultural pride and Authenticity

Tourists frequently associate the Wolio script with a sense of place-specific identity and cultural originality. As one visitor explained:

"Seeing Wolio script on signs makes me feel like I'm truly in Buton, not just anywhere in Indonesia."

4.2.2. Theme 2: Accessibility and Comprehension

Respondents appreciated the clarity of Indonesian while recognizing the added cultural value of Wolio. This balance between understanding and uniqueness was expressed in sentiments such as:

"I can understand Indonesian easily, but Wolio adds a special character to the place."

4.2.3. Theme 3: Curiosity and Learning Interest

Numerous tourists expressed a strong interest in engaging more deeply with local language forms, highlighting a willingness to participate in informal language learning experiences while traveling. One participant noted:

"I wish there were explanations of what the Wolio words mean; it would be nice to learn while travelling."

These themes reinforce the quantitative findings by showing that authentic local language use strengthens tourists' emotional engagement with the place and enhances their overall experience. The qualitative data reveal that visitors are motivated by more than mere comprehension; they actively seek cultural resonance, identity affirmation, and opportunities for incidental learning within the linguistic landscape.

Overall, the quantitative patterns and thematic insights indicate that tourists respond to Baubau's multilingual landscape through both cognitive and emotional connections. These responses highlight the roles of authenticity, accessibility, and curiosity in shaping visitor experience. The integration of geospatial and psychometric data further demonstrates how perceptual meaning-making aligns with applied communication design, informing future strategies for technology-supported multilingual signage in heritage tourism settings.

5. Discussion

Our findings from Baubau City contribute substantive depth to the expanding discourse on linguistic landscapes by reaffirming and extending the foundational insights of Landry and Bourhis [7] and Gorter [8]. These scholars have long demonstrated that multilingual visibility in public spaces serves not only an informational purpose but also a symbolic one, reflecting broader sociocultural dynamics and identity negotiations. Building on this tradition, our study situates these dynamics within the Indonesian tourism context, specifically, Baubau City, where local (Wolio), national (Indonesian), and global (English) languages coexist and compete for visibility. This tri-layered linguistic interaction reveals how multilingual signage functions simultaneously as a tool of communication and a marker of cultural identity. Unlike earlier studies that primarily examined metropolitan or Western contexts, the Baubau case illuminates how linguistic landscapes in emerging tourism destinations mediate tensions

between authenticity and accessibility.

By empirically quantifying tourists' psychological perceptions using Osgood's semantic differential framework, this study advances the methodological scope of linguistic landscape research. The integration of SD-based perceptual scoring with systematically georeferenced signage data enhances the applied dimension of the research, demonstrating how psychometric and spatial perspectives can be combined to evaluate multilingual communication systems in real-world tourism environments. In doing so, this research not only strengthens the conceptual link between language and tourism but also offers practical implications for language policy and planning in multilingual urban environments. Ultimately, the Baubau case underscores how the linguistic landscape of peripheral regions can contribute to the global understanding of language, identity, and experience in contemporary tourism.

Although the ANOVA results did not reach conventional statistical significance, the descriptive pattern remains theoretically meaningful. The consistently higher perceptual scores for Wolio language and Indonesian align with expectations grounded in Osgood's sociopsychological framework, which suggests that individuals respond positively to linguistic forms associated with authenticity and cultural resonance. The findings, therefore, indicate that visitors attach emotional value to locally rooted linguistic expressions. From an applied perspective, this differentiation suggests that multilingual communication design may benefit from foregrounding local linguistic identity alongside accessible global language forms.

A notable outcome of this study concerns the relative position of English, which has traditionally been assumed to dominate global tourism communication. While previous research by Huebner [48], Huebner [49], and Huebner [50] has documented the increasing visibility and symbolic presence of English in multilingual urban environments, our findings present a more nuanced pattern. Rather than confirming the expected prominence of English, the perceptual hierarchy observed in Baubau places Wolio at the top, followed by Indonesian and mixed-language signage, with English receiving the lowest mean scores. This pattern suggests that visitors may respond more favorably to languages that convey cultural depth and local identity. Two explanations may account for this tendency. One explanation involves the broader trend toward experiential and authenticity-driven tourism, while another concerns the specific characteristics of tourists visiting destinations like Baubau, many of whom are motivated by cultural curiosity. These perspectives suggest that linguistic authenticity not only enhances destination appeal but also plays a significant role in shaping visitor satisfaction.

The findings also resonate with the work of Cenoz and Gorter [5]; Cenoz and Gorter [19] and Cenoz and Gorter [36], who emphasize linguistic diversity as a form of cultural capital and a component of sustainable development. In Baubau, community pride in the Wolio language and tourists' favorable perceptions of its use in signage suggest a mutually reinforcing relationship between local identity and visitor appreciation. Rather than viewing language preservation and tourism development as competing priorities, the Baubau case illustrates how they can coexist in harmony. This balance aligns with the linguistic ecosystem described by Cenoz and Gorter, in which heritage and communicative accessibility are complementary. Baubau's linguistic landscape thus functions as both a symbolic space of identity affirmation and a practical space of intercultural engagement, offering insights for other multilingual tourism destinations.

The educational implications of these findings also warrant attention. The positive perceptual response to Wolio suggests that tourists not only recognize authentic cultural symbols but may also engage with them in ways that support informal language awareness. This aligns with Cenoz and Gorter [19]'s argument that regional and minority languages should be understood as resources within multilingual environments. Although this study examined affective responses rather than learning outcomes, the interest expressed by visitors indicates conditions conducive to incidental learning. Encountering unfamiliar languages in meaningful contexts has been shown to support awareness, a core concept in translanguaging-based pedagogies [36, 38]. Baubau's linguistic landscape can therefore be interpreted as a setting where visitors encounter and reflect upon linguistic diversity. This potential may be further supported by interpretive tools such as QR codes or digital heritage guides, although

such applications fall beyond the scope of the present study.

The pedagogical potential identified can be pursued through several practical avenues. Tour guide training programs, for example, could incorporate components addressing the semiotics of multilingual signage. Tourism and language education programs at the university level might integrate material on how language policy and linguistic landscapes contribute to destination branding. Such initiatives position the linguistic landscape as a setting where intercultural understanding and linguistic appreciation can develop organically. Whereas previous research connecting LL and education has primarily addressed formal educational contexts [37, 39], our findings broaden this conversation to include experiential learning within tourism environments. Future research could further explore this by investigating quantifiable learning outcomes and the development of cultural awareness.

In the wider Indonesian context, linguistic landscapes are continually shaped by the dynamic interaction of local, national, and global languages [30, 35]. The findings from Baubau demonstrate that the cultural and pedagogical value of linguistic landscapes extends beyond theoretical discussion and is concretely observable within tourism practice. For educators, these results reveal meaningful opportunities to employ multilingual public environments as authentic, context-rich resources for fostering language awareness and intercultural learning. For policymakers, they underscore the strategic importance of maintaining and visibly promoting indigenous and national languages as integral components of inclusive tourism development and educational planning. In this context, the linguistic landscape serves not only as a symbolic expression of cultural diversity but also as a practical instrument for promoting multilingualism, fostering intercultural understanding, and supporting sustainable engagement with local heritage.

Beyond its educational implications, our findings also address broader issues of language policy and planning in Indonesia. The positive reception of both Indonesian and regional languages among tourists (see Table 3) provides empirical support for Shohamy's [51] and Shohamy's [52] observations concerning inclusive language management, in which linguistic diversity is accommodated rather than minimized. Within this model, Indonesian maintains its integrative role, while regional languages such as Wolio retain symbolic strength in local cultural domains. This balanced coexistence reflects a participatory approach to multilingual policy that aligns with contemporary spatial planning principles and communication strategies employed in tourism development.

From a methodological perspective, this study offers a substantive contribution by integrating Osgood's semantic differential framework with geospatial documentation. Earlier work, such as Backhaus [53], relied heavily on descriptive mapping. Our approach extends this by capturing both the physical visibility of languages and the psychological responses they evoke. This combined perspective highlights the affective dimensions of multilingual environments and supports the use of perceptual data in communication design and signage planning.

The findings also reaffirm the continued relevance of Osgood [13] and Osgood [14] sociopsychological framework of meaning formation. The three SD dimensions proved effective in capturing how tourists internalize and respond to linguistic stimuli in real-world contexts. In the Baubau case study, the indigenous Wolio language scored strongly across all three dimensions, indicating positive affective judgments (evaluation), symbolic strength (potency), and cultural vitality (activity). This pattern validates the versatility of Osgood's model when applied to multilingual visual settings and supports its use in evaluating multimodal communication systems.

Practically, these insights suggest that language choices in tourism settings carry psychological and symbolic significance. The findings imply that foregrounding indigenous and national languages alongside global language forms can enhance visitor engagement. For tourism planners and policymakers, these findings underscore the strategic importance of multilingual management that deliberately embeds local linguistic identity into signage design and broader communication frameworks. Such an approach not only promotes linguistic equity but also strengthens cultural sustainability and reinforces the function of multilingual landscapes as instruments for identity preservation and intercultural learning.

6. Conclusion

This study demonstrates that multilingual environmental signage plays a significant psychological and cultural role in shaping tourists' perceptions within the public tourism spaces of Baubau City. Although the inferential analysis approached but did not meet the conventional threshold for statistical significance ($p = 0.059$), the descriptive pattern reveals a consistent hierarchy of preference. The indigenous Wolio language received the most positive evaluations, followed by Indonesian and mixed-language signage, while English was evaluated less favorably. This hierarchy challenges common assumptions about the universal dominance of English in tourism and highlights the value of linguistic authenticity in shaping visitor engagement.

Beyond the empirical findings, the study affirms that language visibility in public space functions not only as a communicative tool but also as a symbolic resource that shapes the emotional and cultural relationships individuals form with place and identity. Tourists' positive evaluations of Wolio suggest that indigenous linguistic heritage can coexist effectively with national and global codes while contributing to cultural preservation and tourism development. Additionally, integrating psychometric measures with georeferenced signage data demonstrates the usefulness of a spatially informed approach for analyzing perceptual meaning-making within applied tourism communication. Although the study is limited by its cross-sectional design and focus on Baubau City, the methodological framework offers a transferable basis for examining linguistic perception in other multilingual contexts.

This research provides three key contributions. Theoretically, it extends Osgood's Semantic Differential framework into linguistic landscape studies, demonstrating its value for examining the affective dimensions of tourism communication. Methodologically, it advances multilingual landscape analysis by combining perceptual and emotional data with geospatial documentation, thereby enriching applied communication insights and supporting context-sensitive interpretations of signage. Practically, the findings illustrate how indigenous and national languages function as cultural assets in heritage tourism, offering implications for language policy, destination branding, and cultural sustainability initiatives. The study also highlights the pedagogical potential of linguistic landscapes, suggesting that tourists' affective responses may foster informal language awareness and intercultural understanding, an insight relevant to heritage interpretation and tourism planning.

Despite its contributions, the study has several limitations. First, the cross-sectional design restricts the ability to examine changes in perceptual patterns over time. Second, the geographically limited sample may not represent broader Indonesian or international tourist populations. Third, the perceptual data rely on self-reported ratings, which may be influenced by contextual or social desirability biases. Future research would benefit from longitudinal approaches, experimental stimulus manipulation, or comparative studies across multiple heritage destinations.

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Institutional Review Board Statement:

Ethical approval was obtained from the Research Ethics Committee, Faculty of Cultural Sciences, Hasanuddin University (Approval No. 02410/UN4.9.1/PT.01.04/2024) for the period 23 July–30 September 2024. Participation was voluntary, and written informed consent was obtained from all respondents prior to data collection. No personally identifiable information was collected; all data were analyzed in aggregate to ensure participant confidentiality.

Transparency:

The authors confirm that the manuscript is an honest, accurate, and transparent account of the study; that no vital features of the study have been omitted; and that any discrepancies from the study as planned have been explained. This study followed all ethical practices during writing.

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