

Aesthetic Analysis of Street Art: Enhancing Visual Quality in Georgetown Heritage Site, Penang

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ABSTRACT

This study seeks to address the existing research gap concerning the influence of street art on the visual quality of George Town, Penang, a UNESCO World Heritage Site, by examining public aesthetic preferences. It addresses two main objectives: identifying the public's attitude towards street art and determining which visual characteristics of street art contribute to aesthetic preference in George Town. The study incorporates visual analysis and a structured questionnaire, including a photo survey framed within the Q-sort methodology, with 140 participants. The results indicate that most participants perceive street art positively, with the artwork Little Children on a Bicycle receiving the highest level of preference. Factors such as color, balance, and pattern were found to enhance visual appeal. Despite certain methodological limitations, the findings offer practical implications for urban design, suggesting that integrating publicly preferred artistic features can enhance urban aesthetics.

Keywords: Aesthetic Preference, Heritage Site, Q-sort, Street Art, Visual Quality

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INTRODUCTION

In recent years, urbanism has increasingly incorporated creative arts as a tool for urban regeneration, reflecting a global trend in urban design. As cities worldwide shift toward post-industrial economies, many are adopting the creative city model,

leveraging unique cultural assets, arts, and heritage for sustainable growth (Landry, 2017). This model has proven effective for urban revitalization and is being adapted by cities globally to varying extents (Khoo, 2020). Rodwell (2013) emphasizes that heritage and creative industries are complementary, with people acting as both custodians and creators of cultural identity.

However, urban heritage preservation faces multiple challenges, particularly the tension between economic interests and cultural values. This issue is particularly contentious in historic cities, where heritage is often commodified and used as a resource for economic, social, or political gain (Hewison, 1987). As Ke and Mustafa (2024) note,

the commercialization of cultural and heritage assets for tourism can ultimately undermine their authenticity.

Against this backdrop, the increasing presence of street art in heritage cities raises a critical question: Does street art enhance the visual quality of historically sensitive urban environments, or does it generate visual conflict and public resistance? Addressing this question requires an understanding of public aesthetic preferences, which are central to evaluating the appropriateness and impact of street art within heritage contexts.

Street art, gaining mainstream recognition in the 1990s, includes diverse forms such as murals, stencils, and projections, adding vibrancy to urban landscapes (Liang, 2017; MURALS, 2023). George Town, a UNESCO World Heritage Site since 2008, is located in northwest Penang and historically developed as a port city (GTWHI, 2009).

Following this designation, George Town transitioned from a port city focused on trade to a tourist destination, attracting significant attention (Liang, 2017). Over the years, street art has become an integral element of George Town's cultural landscape, prominently visible throughout the heritage site, featured on souvenir products, and promoted via a street art map by Penang Global Tourism to encourage tourist visits (Penang Global Tourism, 2019). Key initiatives include the "Marking George Town" project and the "Mirrors George Town" murals by Ernest Zacharevic, which have made street art a prominent cultural feature (Liang, 2017). However, the pivotal moment for the city's street art scene was the "Mirrors George Town" project by Lithuanian artist Ernest Zacharevic (Liang, 2017). Beyond its aesthetic and cultural contributions, street art has also been shown to generate economic benefits, including increasing the property values of heritage buildings (Cheng et al., 2023).

However, this growth has also attracted criticism. George Town, now renowned for its murals and public art, faces challenges and plans for the removal of unauthorized murals due to complaints about rampant graffiti (Khoo, 2020). Consequently, concerns have emerged regarding the evolving acceptance of street art in George Town, raising questions about whether it continues to be embraced by the community or is facing increasing rejection. This research aims to investigate the impact of street art on the visual quality of George Town. The two objectives of this study are: to determine whether street art positively affects the visual quality of George Town and to analyze the characteristics of street art that align with public visual preferences.

LITERATURE REVIEW

Street Art, Visual Quality and Urban Environment

Street art's contribution to urban visual quality is increasingly recognized as cities evolve beyond traditional forms of art display. This art form, defined by Sadatiseyedmahalleh

et al. (2015) as visual art created in public spaces, enriches the cultural fabric of urban environments, contributing positively to the diversity of artistic expression (Liang, 2017). However, this positive assessment is not without debate. While Liang (2017) traces the origins of street art to New York's ghettos in the 1970s and emphasizes its enduring objectives of expression, communication, and provocation, the shift from marginal practice to mainstream acceptance by the late 1990s raises questions about whether institutional recognition alters its original social and critical functions. This tension suggests that, although street art is increasingly valued for its visual and cultural contributions, its role within contemporary urban spaces particularly those with historical and heritage significance remains complex and contested. In George Town, projects like "Marking George Town" and "Mirror George Town" successfully attracted international artists and contributed to the proliferation of street art. They also reflect a shift toward more institutionalized and officially curated forms of public art within a heritage setting. This distinction is particularly important in George Town, where the balance between creative expression and heritage conservation remains sensitive. Consequently, this research focuses specifically on officially sanctioned artworks, namely murals and iron rod sculptures, which are both the most prevalent and widely recognized forms of street art in the city (Sadatiseyedmahalleh et al., 2015), allowing for a more controlled assessment of their visual and aesthetic impact.

Understanding visual quality is crucial in assessing the impact of street art on urban environments. Visual quality, a broad and abstract concept, is essential for fostering a positive urban identity and enhancing the overall urban experience (Santosa et al., 2018).

Kevin Lynch's work on the mental image of cities highlights the importance of visual clarity or "legibility" in urban design (Lynch, 1960). Building on this, Kvan (2013) emphasizes that visual quality assessment must consider not only architectural form but also surrounding visual elements and users' aesthetic and psychological responses, highlighting the inherently subjective nature of visual perception. From this perspective, street art can both enhance and disrupt visual quality, depending on its integration within the urban context. While high visual quality contributes to pedestrian comfort and positive place experience, achieving it requires coordination among city authorities, communities, and design professionals (Santosa et al., 2018). As Zulestari et al. (2018) argue, visual aesthetics are fundamental to creating welcoming urban environments; therefore, street art, as a prominent visual element of contemporary cities, requires critical assessment in terms of its contribution to urban visual quality.

Visual Quality Assessment and Aesthetic Preference as a Criterion

Visual quality is a multifaceted concept assessed through various methodologies, combining both objectivist and subjectivist perspectives (Santosa et al., 2018; Kvan,

2013). Contemporary studies trace their roots to Kevin Lynch's *The Image of the City* (1960), which has greatly influenced the field (Kvan, 2013). Nasar (1998) defines likability as a psychological construct reflecting subjective evaluations of the environment. Similarly, environmental psychology is commonly understood as the study of interactions between people and their surroundings; however, much of its empirical research has focused less on observable behaviour and more on perceptions of environments and attitudes toward environmental conditions and related behaviours (Moser & Uzzell, 2003). Kvan (2013) identifies two key elements of likability:

- Physical environment,
- User's reaction

These elements are essential in understanding how visual quality influences public perception and satisfaction. Moreover, the study of objective beauty and art often leads to subjective issues (Tatarkiewicz, 2013). Kvan (2013) further concluded that assessing the physical environment from an objective perspective involves observation, analysis, and synthesis. Consequently, Kvan (2013) argues that neither approach is sufficient in isolation; instead, effective visual quality assessment integrates both objective analysis and subjective perception, a position that has become widely adopted in contemporary academic research.

Street art, defined by Sadatiseyedmahalleh et al. (2015) as visual art created in public spaces, is a crucial element of the urban landscape. Aesthetics has become a fundamental issue in architecture and urban landscape design since the mid-seventies, with public preferences increasingly recognized as critical (Keshtkaran et al., 2017).

As cities adopt the creative city model, street art has emerged as a significant cultural asset, enhancing aesthetic appeal. Visual quality assessment, from Lynch's principles of "legibility" to the exploration of physical and environmental user reactions, emphasizes the importance of both objective evaluations of urban spaces and subjective user preferences in shaping public perceptions.

Collectively, integrating aesthetic preferences into urban design underscores the necessity of aligning artistic elements with public needs to enhance the overall urban aesthetic experience. These findings establish a robust framework for developing a methodology to evaluate the impact of street art on visual quality and public preferences in George Town.

The aesthetic theories discussed in the literature directly inform the design of the visual analysis framework and the Q-sort criteria employed in this study. Principles of visual quality derived from formal aesthetics, such as color, balance, proportion, contrast, and spatial organization, provide the basis for objectively analyzing the physical attributes of street art (Glatstein, 2019).

At the same time, theories emphasizing subjective perception and user response, particularly those articulated by Lynch (1960), Nasar (1998), and Kvan (2013), underpin the use of Q-methodology to capture public aesthetic preferences.

By integrating objective visual analysis with subjective preference-based sorting, the research framework operationalizes aesthetic theory into measurable criteria, enabling a systematic evaluation of how specific visual characteristics of street art influence public perceptions of visual quality in George Town.

METHODOLOGY

This research seeks to evaluate the visual quality of street art in George Town by examining public aesthetic preferences. Various methods have emerged to address concerns about urban aesthetics, including incorporating public preferences into the design process (Keshtkaran et al., 2017). As Keshtkaran et al. (2017, p. 97) note, “urban beauty has gradually moved from the scope of objective, emotional, and specialized emphasis related to visual qualities, such as form, color, and texture, to the field of perceptual/subjective studies of the urban environment.”

Therefore, the research will employ two methods to measure visual quality. First, for the objective aspect, visual analysis will be used, a method commonly employed in academic art studies, for effective observation, analysis, and synthesis of the physical environment (Kvan, 2013; Duke University, 2020). Second, for the subjective aspect, Q-sort will be utilized, which is a practical tool for capturing arbitrary preferences and viewpoints. This is to understand users’ reactions based on public aesthetic preferences.

Although Q-methodology is traditionally associated with person-based factor analysis, Q-sorting has also been widely applied as a structured evaluative technique in urban design and visual preference research (Nasar, 1998). In this research, Q-sort is adapted as a photo-ranking tool to examine public aesthetic responses to street art. Rather than aiming to identify distinct subjective viewpoints at the individual level, the method is applied to capture collective aesthetic preferences across a large sample. Accordingly, cumulative scoring is used to classify artworks into preference-based typologies, instead of conducting factor extraction to derive statistical Q-factors.

Assessing public preferences, however, presents challenges due to their subjective nature, which is influenced by individual tastes, complicating objective evaluation and data generation. Despite these challenges, quantification plays a vital role in contemporary assessment methodologies, particularly when evaluating public preferences for scenic beauty (Limited, 2001).

Kang and Liu (2022) identified surveys and questionnaires as methods for evaluating landscape visual quality, while Kvan (2013) noted that photographic images and digital drawings are commonly used techniques for assessing environmental quality.

Thus, two key observations are derived: first, visual analysis beyond physical environment and Q-sort beyond users’ reaction are two methods for assessing visual quality; second, employing photo surveys is a reasonable approach for research. A flowchart of the research methodology is provided in Figure 1 below.

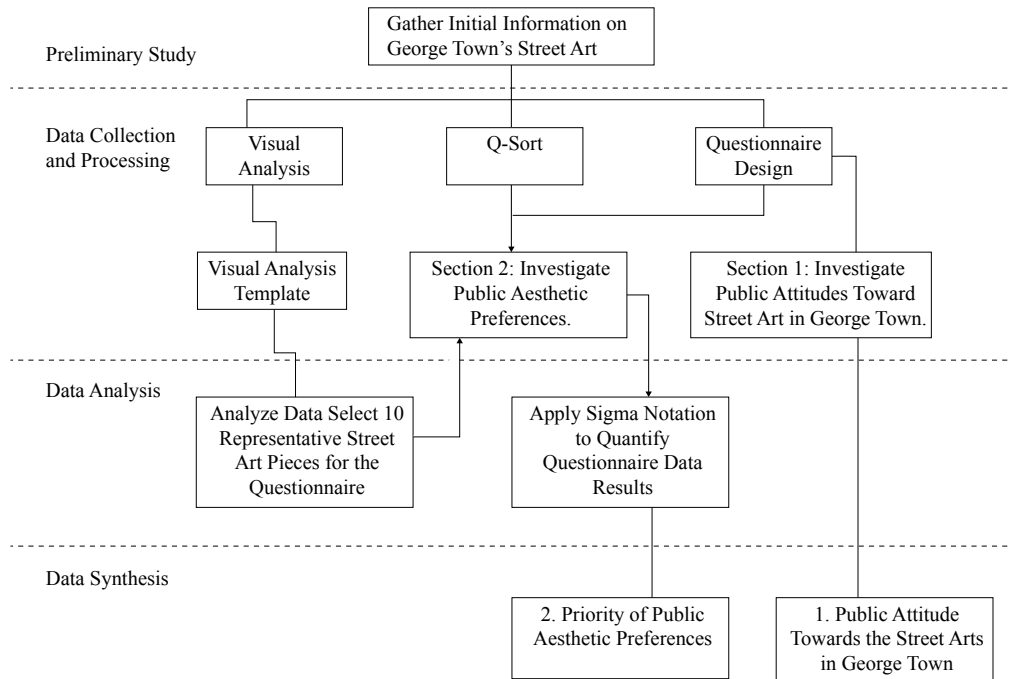


Figure 1. The flowchart of research methodology

CASE STUDY

In the research, the study site was selected in the George Town Heritage site, the overall research area is around 260 hectares, including both the core and buffer zones. The street art forms in George Town were diverse; however, the research conducted by Sadatiseyedmahalleh et al. (2015) concluded that murals and iron rod sculptures are two types of artworks in George Town that were most welcomed by tourists. Therefore, the research subjects will be framed in these two forms of artworks and selected from four projects. The four government-monitored projects were completed in different years, which include (Table 1): “Marking George Town” (2010), “Mirrors George Town” (2012), “101 Lost Kittens” (2013), and “Urban Xchange” (2014) (Hauglann, 2023).

The selection of artworks from the projects is clearly delineated. The 71 artworks adhere to the following selection criteria:

- I. The artworks must be situated within the research area, comprising the core and buffer zones of George Town.
- II. Only murals and iron rod sculptures are included.

Table 1
Total number and selected official artwork in George Town

| Projects name | Artworks number |
|---------------------|--|
| Marking George Town | 52 |
| Mirrors George Town | 6 |
| 101 Lost Kittens | 12 (Only 8 mural artworks were selected; the others are installation and sculpture) |
| Urban Xchange | |
| | 16 (Only 5 mural artworks were selected; the others are located outside the research area) |
| Overall artworks | 86 |
| Selected artworks | 71 |

Visual Analysis

The objective of the research is street art, which is a form of visual art (Sadatiseyedmahalleh et al., 2015). Visual analysis is a foundational method in art and cultural studies, providing a systematic means of interpreting artworks through their visual elements (Duke University, 2020).

In this research, visual analysis was conducted on 71 artworks selected from four projects using a structured framework grounded in established elements and principles of visual design, ensuring consistent evaluation across all artworks. Predefined criteria and a checklist-based assessment were employed to reduce subjective bias and enhance analytical consistency.

There are several elements and principles of visual analysis that need to be understood. After synthesis and concluding from Mittman (2023) and The J. Paul Getty Museum, the visual analysis can be concluded in elements and principles. The elements of visual analysis are: Line, Color, Shape & Form, Space, and Texture/Material. The principles are: Pattern Emphasis, Movement, and Balance. “Contrast is the use of several elements of design to hold the viewer’s attention and to guide the viewer’s eye through the artwork... Unity is created when the principles of analysis are present in a composition and in harmony.” (Glatstein 2019, pp. 1-2). Therefore, contrast will be used as a part of the conclusion, and the elements of design as measurement items to know whether this artwork is in contrast. Similarly, unity will be used to conclude the visual analysis principles (Figure 2).

| THE RESEARCH VISUAL ANALYSIS TEMPLATE | | | | | |
|---|-----------------|------------------|----------------|------------------|----------------------|
| Name of Street Art Project | | | | | |
| Artwork number | Visual analysis | | | | Field Check Notes *2 |
| No. | Part 1 | Contrast *1 | Part 2 | Unity *1 | Score: 1-10 |
| | The Elements | Line | The Principles | Balance | |
| | | Color | | Emphasis | |
| | | Shapes/forms | | Movement | |
| | | Space | | Pattern | |
| | | Texture/Material | | Proportion/Scale | |
| <p>*1 Use ✓ and ✗ as conclusion in stead of words description = This element is contribute on contrast or unity = This element is not contribute on contrast or unity *2 Be scored according to the following criteria: 1. Fade 2. Peeling 3. Integrity</p> | | | | | |

Figure 2. The visual analysis measurement template in this research.

Q-Sort

Q-methodology provides a structured approach to identifying and categorizing individual perspectives and beliefs by grouping people based on their perceptions (Fard, 2007). Unlike traditional rating scales, the Q-sort scale enables participants to express nuanced personal thoughts and emotions (Aransiola, 2024). By categorizing and grouping perceptions, this method provides a data-driven framework for systematically analyzing subjective viewpoints and quantifying emotional responses.

This study’s methodology parallels that of Keshtkaran et al. (2017), where participants categorized photos (labelled A to M) into five columns, from “very beautiful” to “very ugly,” based on personal opinions and preferences. Using Sigma Notation (Figure 3), the authors calculated cumulative scores for each photo, providing a comprehensive tabulated display of public aesthetic preferences, with higher scores indicating greater favorability.

Figure 3. The formula applied in this research (Cited from Keshtkaran et al. 2017).

$$N = \sum_{i=1}^5 n_i (3 - i)$$

The ten sample photos were structurally organized by the researcher into five ordered categories to establish a consistent evaluation framework based on prior visual analysis. Participants were then asked to independently evaluate each photo using a five-point aesthetic scale: ‘very beautiful’ (+2), ‘beautiful’ (+1), ‘ordinary’ (0), ‘ugly’ (-1), and ‘very ugly’ (-2). To determine the overall appeal of each photo, responses were converted into scores by multiplying the number of selections in each category by its corresponding value and summing the results across all participants. To better understand the calculation process, consider the example where $n_1=20$, $n_2=18$, $n_3=17$, $n_4=30$, and $n_5=10$. The total score (N) would be calculated as follows: $N = (20 \times (3-1)) + (18 \times (3-2)) + (17 \times (3-0)) + (30 \times (3-4)) + (10 \times (3-5)) = 8$. Photos with higher total scores were interpreted as having the strongest public appeal.

This approach provides a straightforward and systematic way to compare images based on collective aesthetic preferences. This approach also supports the broader research goal of understanding how specific characteristics of street art contribute to the visual quality of George Town.

Questionnaire

Kang and Liu (2022) confirmed the use of surveys and questionnaires (SQ) as effective methods for evaluating landscape visual quality, making their application in this research appropriate. To investigate public attitudes and aesthetic preferences toward street art in George Town, the research utilized a two-section questionnaire to gain a comprehensive understanding of public opinions.

Section 1 aimed to assess public attitudes toward street art, determining whether it was viewed positively or negatively:

- 1. Why do you come to George Town?**
- 2. Did you notice street art in George Town?**
- 3. Do you like street art in George Town?**

Section 2 focused on exploring public aesthetic preferences. A photo survey featuring ten images, selected through visual analysis, required participants to evaluate each photo using descriptor options: “very beautiful,” “beautiful,” “ordinary,” “ugly,” and “very ugly,” based on their impressions of the images.

A total of 140 participants completed the questionnaire through face-to-face interactions. All participants were recruited from the study area, covering both the core and buffer zones of George Town, ensuring that each participant visited the city and that the results genuinely reflect public perceptions. Although traditional Q-sort studies often employ smaller samples, this study involved 140 participants to capture a broader range of

public aesthetic preferences in George Town, allowing for a more inclusive representation of public views.

RESULTS

Visual Analysis Result

The visual analysis is conducted based on photographs of the artworks to assess whether the elements within each piece are in contrast and the principles are in unity.

Since there are five elements and five principles involved in visual analysis, the number of sample photos was determined to be 10 out of a total of 71 artworks. These photos were selected based on whether the artworks contain qualities of unity and contrast in relation to these elements and principles. In simple terms, sample photos were chosen to capture the diversity of the artworks, ensuring a comprehensive representation. The results of the visual analysis of the street art were synthesized by summing the total number of checks (✓) corresponding to the criteria outlined in the visual analysis framework (Figure 4).

Following the visual analysis, a field check is performed to confirm the artworks' condition, ensuring their suitability for inclusion as sample photos in the photo survey. After completing both the visual analysis and field check, a synthesis of the information from these steps allows for the selection of ten artworks to be used in the photo survey, which forms the second section of the questionnaire aimed at investigating public aesthetic preferences.

| VISUAL ANALYSIS PROCESS | | | | |
|-------------------------|-----------------------|------------|--------------------|--------------------|
| No. | Name of Artworks | Amount (✓) | Field Check Scores | Location |
| Marking George Town | | | | |
| 1 | Shorn Hair | 2 | 10 | Jalan Sungai Ujong |
| 2 | Labourer To Trader | 2 | 10 | Jalan Chowrasta |
| 3 | Kopi O' Kau! | 2 | 10 | Lebuh Kimberley |
| 4 | Mr Five Foot Way | 2 | 10 | Jalan Transfer |
| 5 | Same Taste, Same Look | 2 | 10 | Lebuh Cintra |
| 6 | Roge Style | 1 | 10 | Jalan Pintal Tali |
| 7 | High Counter | 1 | 10 | Lebuh Carnarvon |
| 8 | Cheating Husband | 2 | 10 | Love Lane |
| 9 | Rotan | 1 | 10 | Lebuh Chulia |
| 10 | One Leg Kicks All | 3 | 10 | Lebuh Muntri |
| 11 | Beca | 3 | 10 | Lorong Chulia |
| 12 | Mahjong | 2 | 10 | Lorong Stewart |
| 13 | Temple Day | 1 | 10 | Lorong Muda |
| 14 | Wrong Tree | 2 | 10 | Lorong Pasar |

| VISUAL ANALYSIS PROCESS | | | | |
|-------------------------|-------------------------|------------|--------------------|-----------------------------|
| No. | Name of Artworks | Amount (✓) | Field Check Scores | Location |
| 15 | Too Salty | 1 | 10 | Jalan Green Hall |
| 16 | Gold Tooth | 1 | 10 | Lebuh Queen |
| 17 | Untrained Parakeet | 2 | 10 | Lebuh King |
| 18 | Tok Tok Mee | 2 | 10 | Lebuh China |
| 19 | Roti Benggali | 2 | 10 | Lebuh King |
| 20 | Duck | 1 | 10 | Lorong Che Em |
| 21 | Double Role | 1 | 10 | Gat Lebuh Chulia |
| 22 | Kandar | 2 | 10 | Lebuh Ah Quee |
| 23 | Too Narrow | 2 | 10 | Lorong Soo Hong |
| 24 | Procession | 1 | 10 | Lebuh Armenian |
| 25 | Then & Now | 2 | 10 | Lebuh Armenian |
| 26 | Cannon Hole | 3 | 10 | Lebuh Cannon |
| 27 | Born Novelist | 1 | 10 | Lorong Lumut |
| 28 | Limousine | 1 | 10 | Lorong Carnarvon |
| 29 | No Plastic Bag | 1 | 10 | Lebuh Prangin |
| 30 | Chingay | 2 | 10 | Gat Jalan Prangin |
| 31 | Escape | 2 | 10 | Lebuh Aceh |
| 32 | Happy Hour | 1 | 10 | Jalan Transfer |
| 33 | Win Win Situation | 1 | 10 | Lebuh Muntri |
| 34 | Narrowest Five Foot Way | 2 | 10 | Lorong Stewart |
| 35 | Property | 1 | 10 | Lebuh Victoria |
| 36 | Main Street | 1 | 10 | Lebuh Chulia |
| 37 | Spy | 2 | 10 | Lorong Kampung Malabar |
| 38 | Retail Paradise | 2 | 10 | Lebuh Campbell |
| 39 | Budget Hotels | 1 | 10 | Love Lane |
| 40 | Too Hot | 1 | 10 | Pengkalan Weld |
| 41 | Bullock Cart Wheel | 2 | 10 | Jalan Masjid Kapitan Keling |
| 42 | Quiet Please | 2 | 10 | Lebuh Gereja |
| 43 | Ah Quee? | 1 | 10 | Lebuh Ah Quee |
| 44 | Gedung Rumput | 1 | 10 | Lebuh Queen |
| 45 | Cow & Fish | 1 | 10 | Lorong Ikan |
| 46 | Waterway | 2 | 10 | Gat Jalan Prangin |
| 47 | Ironsmith | 1 | 10 | Lorong Toh Aka |
| 48 | Three Generations | 2 | 10 | Jalan Sungai Ujong |
| 49 | Ting Ting Thong | 1 | 10 | Lorong Seck Chuan |
| 50 | Jimmy Choo | 1 | 10 | Lebuh Leith |
| 51 | “Yeoh” Only | 1 | 10 | Gat Lebuh Chulia |
| 52 | Haj Pilgrimage | 1 | 10 | Gat Lebuh Aceh |

| VISUAL ANALYSIS PROCESS | | | | |
|--|---|------------|--------------------|--------------------|
| No. | Name of Artworks | Amount (✓) | Field Check Scores | Location |
| Mirrors George Town | | | | |
| 1 | Little Children on a Bicycle | 6 | 9 | Armenian Street |
| 2 | The Boy and his Motorbike | 6 | 9 | Ah Quee Street |
| 3 | Little Boy with a Pet Dinosaur | 4 | 4 | Ah Quee Street |
| 4 | Kungfu Girl | 3 | 8 | Lebuh Muntri |
| 5 | Boy On A Chair | 7 | 9 | Lebuh Cannon |
| 6 | Trishaw Man | 2 | 7 | Jalan Penang |
| 101 Lost Kittens | | | | |
| 1 | Skippy For Penang | 1 | 3 | Gat Lebuh Armenian |
| 2 | Cats & Humans Happily Living Together | 5 | 0 | Lebuh Armenian |
| 3 | The Real Bruce Lee Would Never Do This | 3 | 3 | Lebuh Ah Quee |
| 4 | No Animal Discrimination Please | 7 | 6 | Lebuh Armenian |
| 5 | Love Me Like Your Fortune Cat | 6 | 8 | Gat Lebuh Armenian |
| 6 | Please Care & Bathe Me | 4 | 8 | Gat Lebuh Armenian |
| 7 | I Can Help Catch Rats | 8 | 8 | Soo Hong Lane |
| 8 | Cats Walking for Animal Awareness | 4 | 0 | Beach Street |
| The remaining street artworks do not belong to the categories of steel rod sculptures or murals. | | | | |
| Urban Exchange | | | | |
| 1 | Large Quirky And Colourful Boat | 5 | 5 | Genius Parking |
| 2 | Woman With Monkey | 1 | 8 | Genius Parking |
| 3 | The Girl With the Tree Hair | 0 | 8 | Chulia Street |
| 4 | Security | 3 | 8 | Toh Aka Lane |
| 5 | Rose Ice Cream | 4 | 7 | Beach Street |
| The remaining artworks are located outside the George Town buffer zone. | | | | |

Figure 4. Visual analysis results and artwork number





Following the visual analysis and field check, the sample photos were selected based on the results and conclusions derived from the analysis, as detailed in Figure 5.

| THE FORM OF VISUAL ANALYSIS RESULT | | | | | | | | | | | |
|------------------------------------|------------------|----|----|----|--------|---|--------|---|---|---|----|
| Amount (√) | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Urban Xchange Artwork (No.) | 3 | 2 | | 4 | 5 | 1 | | | | | |
| 101 Lost Kittens (No.) | | 1 | | 3 | 6 8 | 2 | 5 | 4 | 7 | | |
| Mirrors George Town (No.) | | | 6 | 4 | 3 | | 1 2 | 5 | | | |
| Marking George Town (No.) | | 6 | 1 | 10 | | | | | | | |
| | | 7 | 2 | 11 | | | | | | | |
| | | 9 | 3 | 18 | | | | | | | |
| | | 13 | 4 | 26 | | | | | | | |
| | | 15 | 5 | | | | | | | | |
| | | 16 | 8 | | | | | | | | |
| | | 20 | 12 | | | | | | | | |
| | | 21 | 14 | | | | | | | | |
| | | 24 | 17 | | | | | | | | |
| | | 27 | 19 | | | | | | | | |
| | | 28 | 22 | | | | | | | | |
| | | 29 | 23 | | | | | | | | |
| | | 32 | 25 | | | | | | | | |
| | | 33 | 30 | | | | | | | | |
| | | 35 | 31 | | | | | | | | |
| | | 36 | 34 | | | | | | | | |
| | | 39 | 37 | | | | | | | | |
| | | 40 | 38 | | | | | | | | |
| | | 43 | 41 | | | | | | | | |
| | | 44 | 42 | | | | | | | | |
| | | 45 | 46 | | | | | | | | |
| | | 47 | 48 | | | | | | | | |
| | | 49 | | | | | | | | | |
| | | 50 | | | | | | | | | |
| | | 51 | | | | | | | | | |
| | | 52 | | | | | | | | | |
| Legend | Selected Artwork | | | | | | | | | | |
| | Tang Mun Kian | | | | | | | | | | |
| | Julian Lefty Kam | | | | | | | | | | |
| | Reggie Lee | | | | | | | | | | |
| | Baba Chuah | | | | | | | | | | |

Figure 5. Conclusions of the visual analysis results and the selection process (the artwork “No.” refers to Figure 4).

Through visual analysis and field check, a selection of sample photos was made, resulting in 10 images that depict both the artworks and their surrounding environments. These photos are summarized in the accompanying Table 2. To facilitate better indexing, the sample photos are recoded in the order from top to bottom and from left to right in Figure 5.

Table 2
Images used in photo survey

| No. | Artworks Photo and Surrounding Environment | Name of Artworks |
|-----|---|---------------------------------|
| A |  | The girl with the tree hair |
| B |  | Rose ice cream |
| C |  | Large quirky and colourful boat |
| D |  | No animal discrimination please |

No. Artworks Photo and Surrounding Environment

Name of Artworks

E



I can help catch rats

F



Kungfu girl

G



Little children on a bicycle

H



Happy hour

I



Labourer to trader

| No. Artworks Photo and Surrounding Environment | Name of Artworks |
|--|--------------------------|
| <p>J</p>  | <p>One leg kicks all</p> |

Regarding the geographical distribution of the 10 artworks, after mapping the locations within the research area, it is evident that the distribution is well-balanced: six artworks are situated in the buffer zone, while the remaining four are located in the core zone. This balanced distribution supports the validity of the selected sample photos for use in the photo survey.

Questionnaire result

In Section 1 of the questionnaire, when participants were asked whether they liked street art in George Town, 96.4% of respondents expressed a positive attitude, indicating strong overall public acceptance of street art in the city (Figure 6). The study aimed to capture broad public aesthetic preferences rather than differences between demographic groups, focusing on inclusive perceptions representative of the wider community.

3. Do you like street art in George Town?
(140 条回复)

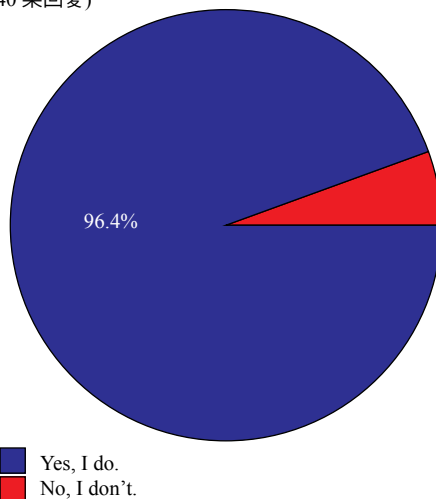


Figure 6. Pie chart of 'Do you like street art in George Town?' result derived from Google Form.

Section 2 of the questionnaire comprised a photo survey using 10 sample photos selected through visual analysis (Table 2). The data analysis, utilizing the formula of "Sigma Notation" within the Q-sort framework, revealed three levels of public aesthetic preferences. The results of the photo survey are summarized (Table 3). Based on responses from 140 participants, the photo scores were calculated and ranked. The artworks with the highest and lowest scores were identified as the first and last priorities.

Table 3

Photo survey results and their score rankings (sorted from high to low).

| The number of photo selectors of different qualities (from 140 respondents) | | | | | | |
|--|------------------------------|-------------------------|------------------------|--------------------|-------------------------|----------------------|
| Photo name | Very beautiful n1 | Beautiful n2 | Ordinary n3 | Ugly n4 | Very Ugly n5 | Photo score=N |
| G | 94 | 35 | 11 | 0 | 0 | 223 |
| C | 65 | 49 | 22 | 2 | 2 | 173 |
| F | 58 | 51 | 30 | 1 | 0 | 166 |
| A | 53 | 60 | 24 | 3 | 0 | 163 |
| H | 43 | 50 | 42 | 5 | 0 | 131 |
| D | 34 | 57 | 38 | 9 | 2 | 112 |
| E | 30 | 51 | 53 | 5 | 1 | 104 |
| B | 35 | 47 | 46 | 10 | 2 | 103 |
| I | 26 | 55 | 47 | 11 | 1 | 94 |
| J | 27 | 51 | 48 | 12 | 2 | 89 |

There are two sample photos positioned in the middle of the ranking. However, upon conducting a comparative analysis of photos H and D, it became evident that photo D should be designated as the middle priority. This determination stemmed from two key factors:

- I. Project Association: Photo D's association with the '101 Lost Kittens' project, as opposed to photo H's affiliation with the 'Marking George Town' initiative, provided photo D with a distinct advantage in exploring the varying impacts of street art on visual quality. The '101 Lost Kittens' project is known for its thematic consistency and cultural resonance, making photo D more representative of impactful street art.
- II. Visual Analysis Results: Upon scrutiny of the visual analysis results, it was apparent that photo H fulfilled only the 'line' element criterion, while the remaining nine elements were unfulfilled. This characteristic aligns with the prevalent features of artworks within the 'Marking George Town' project, which tend to emphasize linear elements but lack in other aspects. In contrast, photo D displayed a more balanced fulfillment of multiple visual criteria, thereby enhancing its competitiveness and relevance.

The analysis further identified photo G, from the "Mirror George Town" project, as the highest-priority artwork. Photo D, from the "101 Lost Kittens" project, was assigned middle priority, while photo J, from the "Marking George Town" project, was ranked lowest in priority.

After determining the three levels of aesthetic preference priority, the results of the visual analysis for the three artworks were reviewed. The characteristics of Photo G include

contrast in shapes/forms, space, and texture/material, with unity in emphasis, movement, and proportion/scale. Photo D features contrast in color and shapes/forms, with unity in balance, emphasis, movement, pattern, and proportion/scale. Photo J exhibits contrast in line and shapes/forms, with unity in movement. The details of the preference priority analysis are summarized in Figure 7.




| | | Aesthetic preference priority and contrast | | |
|----------------|------------------|---|---|--|
| | | G | D | J |
| | | First priority | Middle priority | Last priority |
| Name | | Little Children on Bicycle | No Animal Discrimination Please | One Leg Kicks All |
| Pictures | |  |  |  |
| The elements | Line | | | Contrast in line to express the shape of the artwork. |
| | Color | | Contrast in hue of colors. | |
| | Shapes/forms | Contrast in organic shape and geometric shape. | Contrast in organic shape and geometric shape. | Contrast in organic shape and geometric shape. |
| | Space | Contrast space in reality elements (three-dimensional) and mural (two-dimensional) | | |
| | Texture/Material | Contrast in mural material and the reality materials of bicycle | | |
| The principles | Balance | | Unity balance of the mural overall shape. | |
| | Emphasis | Unity of the emphasis focus on the two kids. | Unity emphasis of the middle of cat. | |
| | Movement | Unity of the movement on two kids ride bicycle. | Unity movement of the cat walking. | Unity movement of the woman behavior. |
| | Pattern | | Unity pattern of the circle dots. | |
| | Proportion/Scale | Unity of the scale between kids and bicycle, as well as the artwork with reality proportion | Unity scale of the artwork with reality proportion. | |

Figure 7. Aesthetic Preference Priorities and Contrasts

In summary, the findings of the research from both the visual analysis and the questionnaire, organized into two parts. The visual analysis assessed the selected street artworks according to predefined visual elements and design principles, which guided the selection of 10 sample photos for the photo survey. The questionnaire results reveal that 96.4% of respondents hold positive attitudes toward street art, emphasizing its cultural and visual significance. Analysis of photo survey preferences highlights that artworks featuring minimal line contrast, harmonious proportions, balanced spatial arrangements, and distinctive material combinations are the most favored.

High-ranking pieces, such as “Little Children on a Bicycle,” demonstrate how artworks that visually harmonize with the historic urban environment align with broader public expectations. These preferences further reveal that, in heritage contexts, street art is expected to complement the environment, enhance visual coherence, and support the city’s historical character without overwhelming or conflicting with it. While this study did not directly measure emotional or cultural responses, it is reasonable to suggest that such visual qualities may contribute to positive perceptions in heritage contexts.

CONCLUSION

This research has significantly deepened our understanding of public attitudes toward street art in George Town, Penang, revealing its strong positive reception and impact on visual quality in an urban heritage context. Key findings highlight that street art in George Town is valued, with the photo survey ranking “Little Children on a Bicycle,” “No Animal Discrimination Please,” and “One Leg Kicks All” as first, middle, and last priorities, respectively. This ranking shows a preference for minimal line contrast, distinctive spatial configurations, and unique materials, with a focus on emphasis, harmonious proportions, color balance, and no unity pattern.

These findings provide guidance for both urban design and heritage planning by identifying street art elements that align with public aesthetic expectations while supporting cultural identity and preserving historical value. Beyond its aesthetic and cultural significance, street art can also generate tangible economic benefits, including the potential to enhance the property value of heritage buildings. As noted by Cheng et al. (2023), street art constitutes an integral component of George Town’s cultural and historic identity, warranting preservation through both governmental policy and community engagement.

The research framework and methodology lay a strong foundation for future studies and provide valuable insights for urban planners and artists alike. Integrating public preferences into urban design can enhance the visual quality and cultural vibrancy of urban spaces, while at the policy level, the findings offer empirical support for more inclusive and evidence-based public art governance.

However, this study is limited by its single-site focus on George Town and the use of purposive sampling, which may constrain the generalizability of the findings. Although the visual analysis employed a standardized template based on visual elements and principles, it was conducted by a single researcher, potentially limiting the reliability of the analysis. In addition, participants were not stratified by demographic characteristics, which precludes examination of potential differences in aesthetic preferences across population subgroups.

Therefore, future studies should extend to multiple heritage cities and involve multiple researchers in the visual analysis to enhance analytical reliability. Additionally, including a broader range of residents' perspectives, as key community stakeholders, would provide a more comprehensive understanding of public attitudes toward street art. A larger sample size would also improve the comprehensiveness of the findings. Additionally, future research should expand to include a broader range of street art, including unauthorized graffiti, to provide a more holistic understanding of its impact on urban aesthetics and community dynamics in George Town.

RESEARCH CONTRIBUTION

Valuable insights into the impact of street art on urban environments, particularly in George Town, are provided by this research. By employing visual analysis and Q-methodology to analyze public aesthetic preferences, the study offers a systematic approach to capturing subjective perceptions of street art, advancing the field of visual quality assessment. The study highlights how specific artistic elements of street art can enhance urban aesthetics and cultural value, providing insights into the interplay between art and the urban environment. Besides, the research created a quantitative visual analysis template as a reference for future aesthetic analysis. Furthermore, the research challenges prior assumptions regarding public attitudes toward street art, as evidenced by the positive reception found in this study, in contrast to earlier concerns in Khoo's (2020) research. The findings lay the groundwork for further studies on how public art shapes cityscapes and cultural identities, contributing to the body of knowledge on urban regeneration and the integration of art in city planning. This contribution is particularly relevant for heritage cities seeking evidence-based approaches to balancing cultural preservation and contemporary public art.

PRACTICAL CONTRIBUTIONS

Practically, this research provides a valuable framework for integrating public opinion into urban design and art projects, with particular relevance to heritage cities like George Town. The findings offer essential insights into public preferences, helping urban designers and policymakers make informed decisions when incorporating street art into cityscapes. By

identifying the specific artistic features that resonate with the public, the study can guide future urban design projects to enhance visual appeal and foster community engagement. Additionally, the research sets a precedent for using public opinion to shape inclusive, aesthetically pleasing urban environments, promoting a more participatory approach to urban art and design. Such an approach supports policy frameworks that encourage transparent, community-informed decision-making in public art management.

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