

Spatial heterogeneity in the impact of traditional mountainous urban patterns on retail industry location

A case study of Chongqing historic district

Ziqi WU, Chongqing University, China

Xiliu HE, Southeast University, China

Heping LI, Chongqing University, China

Abstract

The objective quantification of urban patterns' influence on industrial location has always been an important issue in urban geography. As the most crucial component of urban service activities, retail industry's location choice and spatial expansion are seen as significant outcomes of urban pattern shaping. Yuzhong District, as Chongqing's mother city, best exemplifies the mountainous urban characteristics of Chongqing. It concentrates ancient Chongqing's historical and cultural heritage and is also where retail businesses are most densely clustered. Different urban spatial cultural types determine consumer types and scale, forming consumption characteristics that shape urban regional features. Exploring retail distribution characteristics in mountainous urban districts and analyzing their interaction mechanisms with historical spatial elements helps form culturally distinctive urban imagery through location preference and spatial layout strategies, thus playing a fundamental role in guiding urban commercial space development and reviving Chinese traditional mountain city culture.

This study takes China's most typical traditional mountain city region - the Two Rivers Junction area of Chongqing's Yuzhong District as an example. Based on the latest POI data, combined with kernel density, local hotspot analysis, spatial correlation analysis and natural language processing methods, it explores the distribution characteristics, industry correlation characteristics and consumption symbolic characteristics of retail consumption space in Chongqing's historical district from a historical and cultural perspective. The study finds that the retail consumption space pattern in the Two Rivers area is "mainly concentrated in the eastern historical city wall area, with dual-core aggregation and multi-point dispersion coexisting", showing close association with historical resource elements and reflecting the local cultural characteristics of "openness, freedom, diversity and inclusiveness", providing scientific basis for mountain city planning and construction and shaping urban cultural imagery.

Keywords

Mountain city, Retail consumption space, Spatial characteristics, Historical district, Consumer culture, Urban morphology

1. Introduction

1.1. Interaction Between Retail Commercial Space and Urban Morphology

With China's rapid economic development and accelerating urbanization process, retail industry has entered a period of rapid growth, and many cities have gradually transformed from "production-oriented cities" to "consumption-oriented cities" (Zhou, 2014). Under the development background of "consumption-oriented cities", a city's success or failure largely depends on its advantages in the consumption sector (Glaeser, 2006). For instance, in terms of urban economic development, consumption has gradually become the mainstay of economic growth. In terms of urban commerce, commercial space patterns, business development models, and residents' daily consumption behaviors also change with urban morphology transformation, thereby giving rise to more diverse consumption demands such as scenario-based, experiential, and interactive modes (Cao, 2019).

Retail business behavior serves as the "capillaries" of urban commercial activities. China's retail commercial space research has yielded abundant results, covering multi-scale characteristics of retail commercial layout from national and urban to community levels (Hao, 2019). As the historical inheritance subject of urban development, historical districts have traditionally concentrated large amounts of urban internal flows of people, goods, information, and capital, making them important components of cities (Wang, 2018). Chongqing is China's youngest municipality directly under the central government. Its main urban district's retail enterprises started early, with large quantities, complete business formats, and comprehensive varieties (Liu, 2021). Its commercial circle spatial structure is influenced by specific urban spatial structures, differing from China's traditional plain cities' band-type spatial patterns. Based on ground level and extending three-dimensionally underground and skyward, it exhibits typical mountain city characteristics (Chen, 2012). Mountain cities are complexes of natural geographical units such as mountains, hills, rivers, and bays, thus urban morphology has an even greater impact on commercial space layout (Tu, 2019). Studying the relationship between mountain city morphology and retail commercial space helps grasp mountain city location selection patterns and enriches relevant theories of urban geography and location theory. Additionally, it can guide mountain city planning and construction by mapping urban spatial structure and functions through retail industry's spatial patterns and structures, promoting positive spatial interactions between retail layout and urban space.

1.2. Impact of Urban Cultural Space on Consumption Characteristics

Compared to newly developed urban districts, historical districts represent past urban forms and play a crucial role in contemporary urban development (Nyseth, 2013). From a historical perspective, historical districts are relatively old parts of cities with stable socioeconomic structures and rich customs and cultural habits (Wang, 2009), requiring reasonable protection and renewal to revitalize. Culture, as the soul and temperament of cities, leads people toward nobility, courtesy, self-respect, and fulfillment (Wu, 1997). When cities face opportunities or crises, revitalizing urban space from a cultural dimension is the true and lasting path of urban development (Huang, 2010). Examples like Birmingham's Brindley Place, Liverpool's Albert Dock, Chengdu's Kuanzhai Alley, and Hangzhou's Southern Song Imperial Street are all demonstrative cases of urban space cultural revival strategies (Huang, 2006). Cities must have their own cultural spirit and cultural symbols, allowing residents and tourists to clearly grasp urban images and spiritual connotations, forming their own urban brands (Wang, 2017).

The transition from traditional material consumption to modern service-oriented experience has become a basic characteristic of retail enterprise development (Liu, 2021). Experience is a memorable activity where sellers use services as stages and goods as props, existing within consumers' minds and involving their physical, emotional, and intellectual participation (Schmitt, 1999). Similarly, the cultural experience generation process in retail commercial spaces uses spatial layout, architectural form, and landscape environment as experiential media, and business format composition and activity settings as activity experience media, which can be seen as the process of experiencing urban spatial cultural characteristics (Hu, 2015). Urban space is a functional space for human activities, and different urban spatial cultural types determine the types and scale of consumers (Tu, 2019), forming consumption characteristics and thereby shaping urban regional features, reflecting the combination of traditional historical culture and modern urban space quality requirements (Chen, 2019). Taking British cultural and creative industries as an example, since 2005, these industries have grown at twice the rate of overall GDP growth for eight consecutive years, creating enormous job opportunities, promoting urban residents' cultural education, and spatially creating a series of impressive cultural tourism routes and districts (Gao, 2018). In the postmodern context, culture and consumption have become inseparable concepts (Wang, 2017). Urban space, as the physical spatial carrier of culture and consumption, when given certain historical significance, its spatial consumption changes will profoundly impact urban culture and urban spatial structure.

1.3. Regional Characteristics of Retail Space in Historical Districts

Yuzhong District is Chongqing's mother city and the birthplace of Ba-Yu culture, best reflecting Chongqing's mountainous city characteristics (Pei, 2017). The Yangtze River and Jialing River converge here, traditional commerce originated here, and the city's embryonic form was nurtured here, concentrating ancient Chongqing's historical and cultural heritage. Its main body is the Huguang Guild Hall - East Water Gate historical and cultural district, where merchants gathered and shops lined the streets, being Chongqing's most prosperous commercial district from ancient times to present, and the most densely concentrated area for retail enterprises (Liu, 2021). With numerous historical residences like Hu Zi'ang's former residence and Xie Family Mansion, alleys full of urban life such as Banana Garden Lane, Xiahong Study Lane, and Drum Lane are scattered throughout, containing old Chongqing's spirit and soul. Meanwhile, it is also one of Chongqing's CBD financial centers (Wang, 2017), producing leading economic, political, and cultural central effects.

Yuzhong District is built on a "peninsula" mainly consisting of Pipa Mountain and Goose Hill. "Mountains" are the objective material elements that constitute Chongqing's urban fabric, serving both as carriers for urban development and as organic components of the city. Ancient Chongqing's urban construction adapted to the natural terrain, organically distributed among mountains and waters, forming popular mountain-water cultural characteristics shaped through residents' interactive settlement practices. Both Chongqing's urban spatial form and architectural style demonstrate prominent characteristics of "following natural timing and taking advantage of geographical conditions", which is inseparable from the creative play of "human harmony", and shows Chongqing culture's openness and inclusiveness (Wang, 2005). In recent years, Yuzhong District has vigorously promoted the inheritance and renewal of historical culture, continuously advancing the integration of culture, commerce, tourism, industry, city and landscape. It has proposed three development goals: restoring the historical appearance of "Old Chongqing", enhancing the cultural tourism quality of the "New Mountain City", and developing "Most Chongqing" cultural tourism industry. The scale of cultural and tourism

industry in Yuzhong District continues to grow, forming cultural creative development clusters and a diversified industrial spatial pattern with historical districts, parks, bases, and buildings as carriers. The actual operational benefits of cultural tourism hotspots have risen rapidly overall, with obvious advantages in areas like Hongyadong and Eighteen Steps.

Retail enterprises, as important players in urban commercial activities, are the main platform for connecting with residents' consumption needs and powerful assistants in optimizing urban spatial planning (Liu, 2021). Therefore, exploring the distribution characteristics of retail industry in mountainous urban districts and sorting out its influence mechanism with historical spatial elements is to summarize and form urban image associations with cultural characteristics from location selection preferences and spatial layout strategies, to guide urban commercial space development. This provides decision-making reference for maintaining local culture and cultural diversity, creating new driving forces for urban development in the post-industrial era. Urban space is the material carrier of culture and plays an important foundational role in the revival of Chinese urban culture. The era of economic development as a single development goal has ended, while multiple development goals highlighting cultural value, ecological value, and social value have become the main direction of future urban development (Wang, 2017). Urban spatial culture should provide ethical, aesthetic and poetic nurturing to the people, and all memorable people, events and places should leave respectable cultural footprints. The consumption spatial form of historical urban districts should reflect the cultural personality of the mountain city, become the spatial discourse of the mountain city, and display urban spirit and symbols (Huang, 2010).

Therefore, taking China's most typical traditional mountainous urban area - Chongqing's Yuzhong Two Rivers Confluence Area as an example, this study explores the distribution characteristics, industrial correlation characteristics and consumption symbol characteristics of retail consumption space in Chongqing's historical urban district from a historical and cultural perspective, based on the latest point of interest data, combined with kernel density, local hotspot analysis, spatial correlation analysis and natural language processing methods, to provide scientific basis for mountainous urban planning and construction.

2. Research Data and Methods

2.1. Study Area and Data Sources

The Two Rivers Confluence Historical District is located at the confluence of the Yangtze River and Jialing River in central Chongqing, covering an area of approximately 13.36 square kilometers. It extends north to the Chaotianmen Yangtze River Bridge, south to Nanbin Road, west to the Hongyan Village Bridge (bounded by the western edge of the Eighth Route Army Chongqing Office Site - Hongyan Village No. 13 construction control zone), and east to Tushan Road.

This study uses Point of Interest (POI) data as its basic dataset, sourced from the open-source data provided by the Amap Open Platform, collected in December 2022. The retail consumption space data is categorized into four types: Food & Beverage, Hotel & Accommodation, Shopping & Consumption, and Leisure & Entertainment (Table 1). After data cleaning and coordinate correction, a total of 10,663 POI data points were extracted (Figure 1).

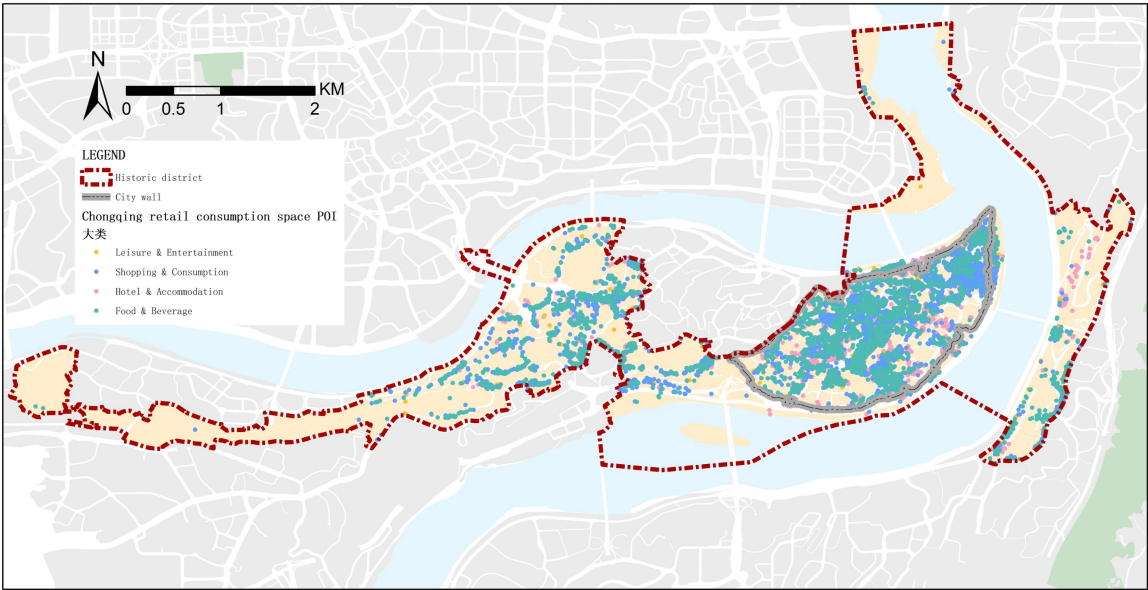


Figure 1. Study area and data. Source: Authors.



Table 1. Types of retail consumption space. Source: Authors.

2.2. Research Methods

2.2.1. Kernel Density Analysis

Kernel Density Analysis calculates the value per unit area using a kernel function based on point features. It estimates the degree of spatial point feature clustering using a regularly moving quadrat, reflecting the relative concentration degree of element spatial distribution. This is a commonly used research method for identifying spatial aggregation (Yu et al., 2016).

2.2.2. Average Nearest Neighbor Analysis

The Average Nearest Neighbor Analysis calculates the nearest neighbor index based on the average distance between each feature and its nearest neighboring feature and the expected average distance under random distribution. This determines whether point features exhibit clustered or uniformly dispersed distribution patterns, quantifying the degree of clustering.

2.2.3. Local Spatial Autocorrelation Analysis

Local Spatial Autocorrelation Analysis determines the correlation between data at adjacent spatial locations by defining research scale, constructing spatial weight matrices, and calculating spatial autocorrelation indicators such as Moran's I. This can be used to detect hot and cold spot clusters of various retail consumption spaces.

2.2.4. Spatial Correlation Analysis

Spatial Correlation Analysis is based on the Pearson correlation coefficient model to analyze POI elements that may have correlations, exploring the degree of spatial correlation between different types of POIs. This study conducts spatial correlation analysis after normalizing grid cell sizes to eliminate density differences caused by point feature quantities (Zhang et al., 2022).

2.2.5. Text Analysis Based on Jieba and Wordcloud

For cultural scene analysis, we employ Python-based natural language processing tools. Jieba, a Chinese word segmentation tool, is used for text analysis and processing, while Wordcloud is utilized for visualization of word frequency analysis. The combination of Jieba word segmentation and Wordcloud visualization enables a comprehensive analysis of important keywords, revealing the characteristics of retail consumption spaces from a cultural perspective.

3. Case study

3.1. Distribution Characteristics of Retail Consumption Spaces

Overall, there is a high number of POIs with dense distribution and diverse categories. From a spatial perspective, the retail consumption spaces demonstrate an evident east-west differentiation, with concentration in the eastern historical district and relatively sparse distribution in the western area of the Two Rivers Confluence District. This distribution pattern closely follows the city's mountainous topography and shows a clear correlation with the Yangtze and Jialing river systems, reflecting the unique characteristics of the mountainous urban form.

The kernel density analysis (Figure 2a) reveals a spatial pattern characterized by "dominance of the eastern historical city wall area, dual-core aggregation coexisting with multi-point dispersion." The distribution is primarily concentrated in the historical city wall area, centered around two traditional commercial districts: "Jiefangbei-Qiaogoukou" and "Chaotianmen-Xiaoshizi." These areas, which include major commercial landmarks such as Dacheng Department Store, Chongqing Department Store, and Guotai Arts Theatre, form significant commercial nodes with distinct spatial clustering characteristics.

Different types of retail consumption spaces exhibit varying spatial structures:

1. Shopping consumption (c) and leisure entertainment (e) display a "dual-core" spatial structure, with cores at "Jiefangbei-Qiaogoukou" and "Chaotianmen."
2. Food and beverage establishments (b) show a "main core + radiation area" pattern, with the core concentrated in the "Jiefangbei-Qiaogoukou" district and forming connected radiation zones.
3. Hotel accommodation (d) exhibits a more dispersed "scattered points" spatial structure without obvious core areas.

This differentiated distribution pattern reflects the historical evolution of Chongqing's urban form and the influence of its unique mountainous topography on retail space development. The spatial organization demonstrates how different retail functions have adapted to and been shaped by the city's natural and historical urban patterns, creating a complex and layered commercial landscape that characterizes the Two Rivers Confluence Historical District.

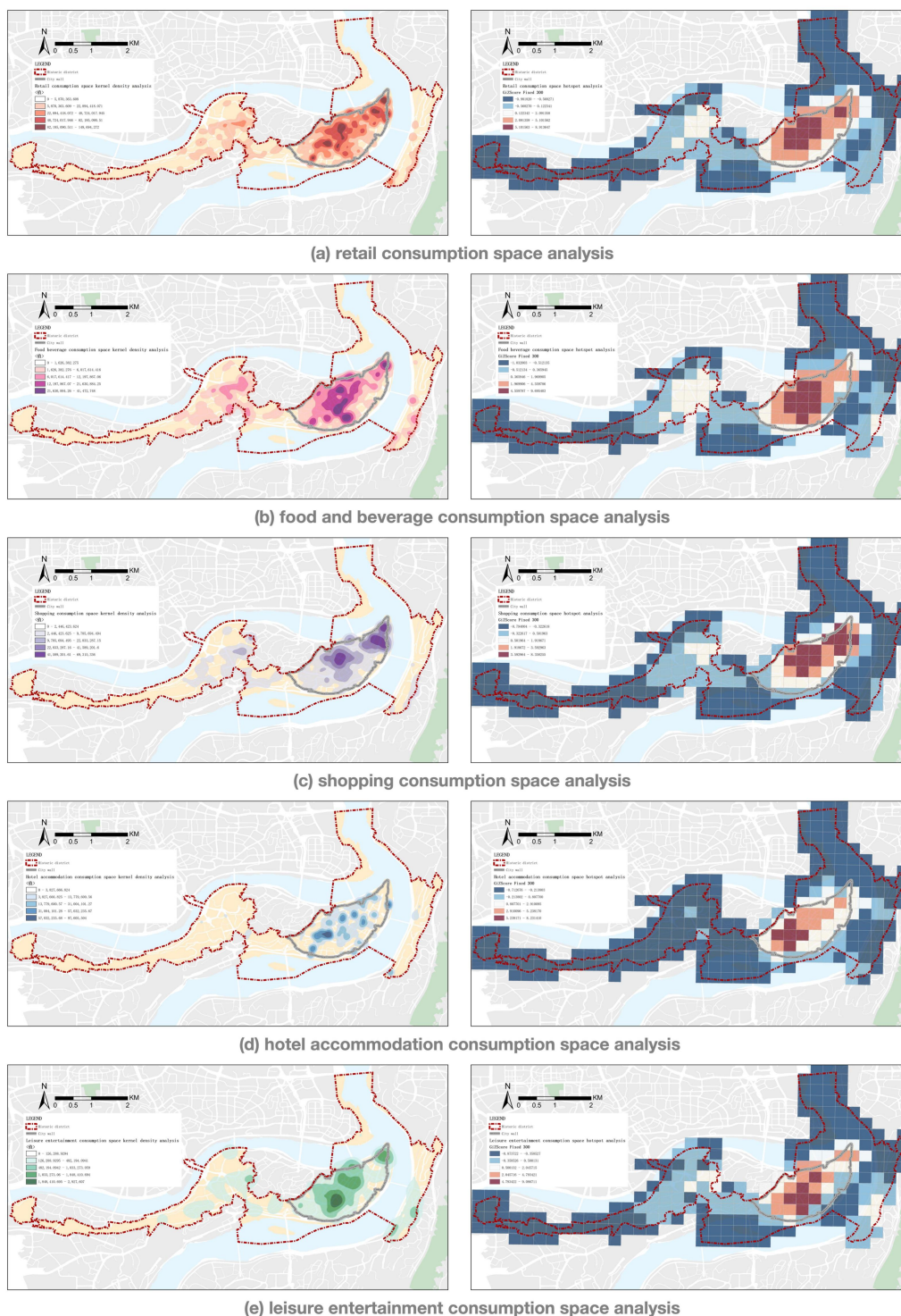


Figure 2. (a) Kernel density analysis and hotspot analysis. Source: Authors.

Further analysis of spatial aggregation patterns through the nearest neighbor index calculation reveals distinct clustering characteristics among different retail categories (Figure 3).

In terms of aggregation degree, from highest to lowest, the order is hotel accommodation (0.23), food and beverage (0.25), shopping consumption (0.26), and leisure entertainment (0.47).

The analysis of POI quantities combined with kernel density and hotspot analysis demonstrates that food and beverage, hotel accommodation, and shopping consumption not only have relatively large numbers of establishments but also exhibit high degrees of aggregation. This finding is particularly noteworthy as these three categories, while representing basic and daily retail consumption spaces in the city, maintain relatively concentrated distributions within the historical urban area without showing obvious dispersion trends. In contrast, leisure entertainment facilities show both fewer numbers and lower aggregation characteristics, with an observed average distance of 63.98 meters and an expected average distance of 137.06 meters, indicating a more scattered distribution pattern compared to other retail categories.

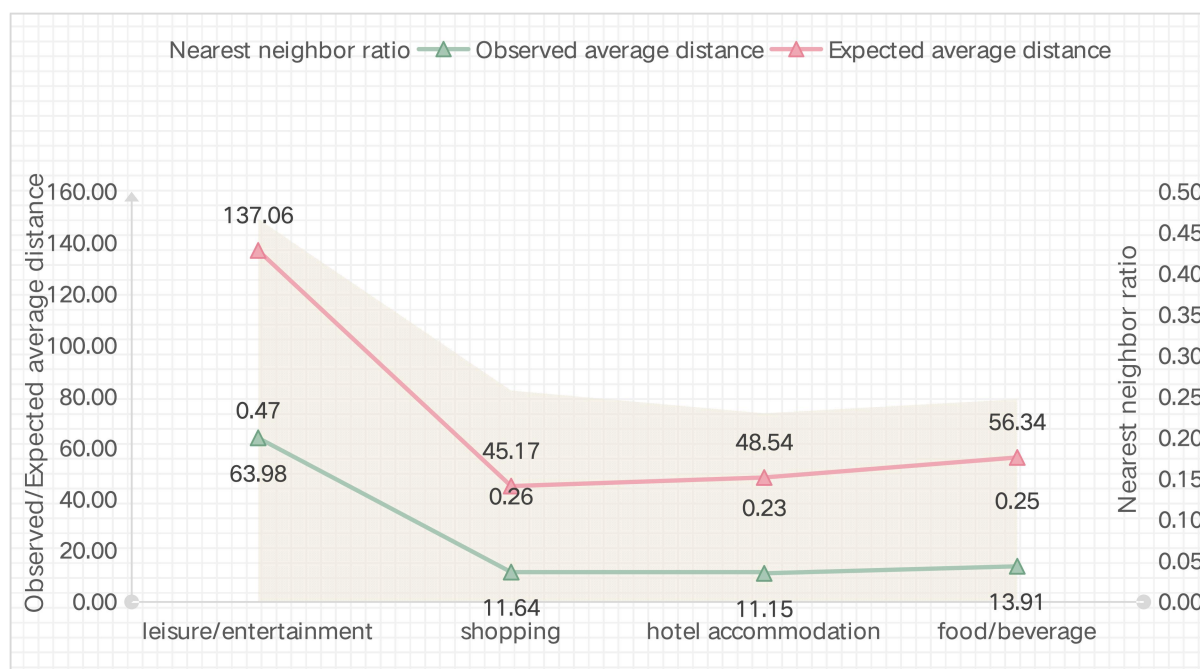


Figure 3. Nearest neighbor index analysis. Source: Authors.

3.2. Retail Consumption Spatial Correlation

Following the analysis of distribution characteristics, we examined the spatial correlations between different types of retail consumption spaces. After normalizing the grid cell sizes of each facility type, correlation coefficients were calculated based on the Pearson correlation model, resulting in a correlation matrix for the four types of retail consumption spaces in Chongqing's historic urban area (Table 2). Generally, correlation coefficients can be categorized into four levels: 0-0.09 (no correlation), 0.09-0.3 (weak correlation), 0.3-0.5 (moderate correlation), and 0.5-1.0 (strong correlation).

The analysis reveals that strong correlations dominate between facility types, with most correlations significant at the 0.01 level. The strongest correlation is observed between

food/beverage and leisure/entertainment facilities (0.850), indicating their close spatial proximity and functional complementarity. In contrast, the weakest correlation exists between shopping consumption and hotel accommodation (-0.005), showing only moderate spatial interdependence.

Food and beverage facilities demonstrate particularly strong correlations with all other types (ranging from 0.534 to 0.850), suggesting their widespread distribution and high interdependence with other facilities. This pattern indicates that food and beverage establishments serve as fundamental retail consumption spaces in the district, acting as anchors that support and attract other retail categories. Their extensive spatial distribution reflects their role in providing daily consumer services while also integrating with various commercial functions.

Hotel accommodation facilities show relatively weaker correlations with other retail types (coefficients ranging from 0.418 to 0.534). This pattern can be attributed to the distinct nature of hotel services, which primarily cater to non-local populations. Unlike other retail consumption spaces that prioritize local community needs and commercial synergies, hotel location choices are more influenced by factors such as accessibility to tourist attractions and business districts.

	Food/beverage	shopping	leisure/entertainment	Hotel accommodation
Food/beverage	1	0.702**	0.850**	0.534**
shopping	0.702**	1	0.625**	0.418**
leisure/entertainment	0.850**	0.625**	1	0.511**
Hotel accommodation	0.534**	0.418**	0.511*	1

Table 2. Spatial correlation coefficients of retail consumption space. Source: Authors.

3.3. Consumption Scenario Analysis Based on NLP

To explore the urban cultural symbols and consumption phenomena behind the retail and consumer spaces in Chongqing's historical district, text segmentation statistical analysis of retail consumer space POI names was conducted using Jieba and Wordcloud modules. The font size was adjusted according to the frequency of occurrence, as shown in Figure 4.

The word frequency statistics results of various retail consumer spaces show distinct Chongqing characteristics. For food and beverage retail spaces, the most frequent words are "Traditional Hotpot," "Hotpot," "Teahouse," "Coffee," "Noodle House," and "BBQ Restaurant." "Hotpot" reflects Chongqing people's preference for hotpot cuisine, while "Teahouse" and "Coffee" reflect Chongqing's unique leisure consumption culture.

For shopping and retail spaces, the most frequent words are "Convenience Store," "Supermarket," "Groceries," "Apparel," "Tobacco and Liquor," and "Jewelry." "Convenience Store" and "Supermarket" reflect the typical spatial forms of shopping consumption in Chongqing's historical district, while "Groceries," "Apparel," "Tobacco and Liquor," and "Jewelry" reflect diverse shopping consumption orientations.

For hotel and accommodation spaces, the most frequent words are "Apartment," "Guesthouse," "River View," "High-rise," "Mountain City," "Jiefangbei," and "Hongyadong." "Apartment" and "Guesthouse" reflect the large number of flexible, small-scale capital investments in short-term rental markets through guesthouses and apartment-style accommodations. "River View" and "Mountain City" reflect the unique Chongqing landscape's competitiveness in the hotel market. "High-rise" reflects how Chongqing's vertical residential building forms as a mountain city attract numerous tourists. "Jiefangbei" and "Hongyadong" reflect popular hotel location choices, which corroborates with the kernel density and hotspot analysis results.

For leisure and entertainment spaces, the most frequent words are "Bar," "Karaoke," "Board Games," "Entertainment Room," "Mahjong," and "Dance Hall." These words reflect the diverse types of leisure and entertainment consumption spaces and a lifestyle that emphasizes entertainment.

As physical spatial carriers of culture and consumption, retail consumer spaces represent the coupling of urban culture and spatial consumption, while also mapping urban cultural symbols different from other regions. The word frequency statistics results of various retail consumer spaces in Chongqing's historical district demonstrate the area's primary consumption characteristics and reflect the urban consumption culture Chongqing presents to both local residents and tourists. Among these, the mountain city pattern and leisurely lifestyle are Chongqing's most attractive consumption cultural symbols.



Figure 4. (a) food and beverage NLP analysis; (b) shopping NLP analysis;

(c) hotel accommodation NLP analysis; (d) leisure entertainment NLP analysis. Source: Authors.

4. Conclusion and Discussion

4.1. Research Findings and Contributions

4.1.1. Distribution Characteristics

Our GIS analysis revealed that retail consumption spaces in Chongqing's historic district are numerous, densely distributed, and diverse. The spatial pattern shows a distinct concentration in the eastern historical area, characterized by dual-core aggregation and multi-point dispersion. The four consumption sub-categories (dining, shopping, accommodation, and leisure) displayed distinct spatial distributions with high correlation. The analysis identified two major commercial cores - "Jiefangbei-Qiaogoukou" and "Chaotianmen-Xiaoshizi" - which serve as primary nodes in the retail network, while different retail categories demonstrated varying degrees of spatial clustering and dispersion patterns.

4.1.2 Consumption Scenario

Natural language processing of consumption scenarios highlighted Chongqing's unique urban consumer culture. The analysis revealed distinct characteristics across different retail categories, from food and beverage establishments reflecting local culinary traditions to leisure spaces embodying social interaction patterns. Notably, the mountainous urban layout and leisurely lifestyle emerged as key cultural symbols, demonstrating how geographical features and local culture interweave to create unique consumption spaces. These findings underscore the complex interplay between urban geography, consumer behavior, and local culture in shaping retail spaces in mountainous cities.

4.2 Research Limitations and Future Directions

Our study has certain limitations, primarily in terms of data and methodology. The current analysis relies on limited data sources and precision levels, which may affect the comprehensiveness of our findings. Methodologically, there is room for improvement in our natural language processing techniques, particularly in capturing more nuanced cultural patterns.

To address these limitations and advance this line of research, we propose several future directions. We plan to utilize more diverse and high-precision data sources to enhance the accuracy and depth of our analysis. Furthermore, we intend to employ more advanced natural language processing models to gain deeper insights into consumer behavior and cultural patterns.

5. References

- Iosifidis, P. (2011). 'The public sphere, social networks and public service media', *Information, Communication & Society*, 14(5), 619-637.
- Simonofski, A., Fink, J., & Burnay, C. (2021). 'Supporting policy-making with social media and e-participation platforms data: A policy analytics framework', *Government Information Quarterly*, 38(3), 101590.
- Zhou S.H., Hao X.H., & Liu L. (2014). 'Validation of spatial decay law caused by urban commercial center's mutual attraction in polycentric city: Spatio-temporal data mining of floating cars' GPS data in Shenzhen', *Acta Geographica Sinica*, (12), 1810-1820.

- Cao Q.M. (2019). 'Research on Spatial Distribution Change of Commercial Network in Old District and Its Influencing Factors: A Case Study of DapingArea, Chongqing(Master's thesis, Chongqing University)', *Master*,
<https://link.cnki.net/doi/10.27670/d.cnki.gcqdu.2019.002512>doi:10.27670/d.cnki.gcqdu.2019.002512.
- Glaeser, E. L., & Gottlieb, J. D. (2006). 'Urban resurgence and the consumer city', *Urban studies*, 43(8), 1275-1299.
- Hao F.L.,Yang Y.X.,Li J.L., Li Y.L.,&Wang S.J. (2019). 'Characteristics of Commercial Centers in Changchun from the Perspective of Retailing', *Economic Geography*(12),138-146.doi:10.15957/j.cnki.jjdl.2019.12.016.
- Liu G.S.,Zhang Y.,&Cao X. (2023). 'Research on the Influencing Factors of Spatial Distribution and Location Choice of Retail Enterprises in Chongqing Main Urban Area', *Urban Geotechnical Investigation & Surveying*(06),44-49.
- Wang X.M.,Wang J.,&Zhu Q. (2018). 'Identification of Hollowing Phenomenon in Commercial Space of Six District of Beijing Based on Checking-in Data', *Urban Development Studies*(02),77-84.
- Chen D.J. (2012). 'A Study on The Spatial Structure of Commercial District inChongqing Main City(Master's thesis, Chongqing University)', *Master*,
https://kns.cnki.net/kcms2/article/abstract?v=gpYIZH45TFmp_gB-PfzHAANf0a7dFshDdKytGm98udi-QC_GXzcYju7vL4Tmcl8jPo1xL_NK1msfksqwJzuYfu9XeKw_oix6MK4KMbCFQHdh-dNCWOD3qooGscKOW9ZbFbhkrs4Lr1T5T_ApCuA0StRwoAcNfEAXp6puNUypKJdNypWnwsPSOoknnoh0gfyx_Ezfs2ypA8=&uniplatform=NZKPT&language=CHS
- Wang Y.,Wang X.O.,&Zhang S.S. (2009). 'A system dynamics model of urban renewal', *Journal of Shenzhen University(Science and Engineering)*(02),169-173.
- Nyseth, T., & Sognnæs, J. (2013). 'Preservation of old towns in Norway: Heritage discourses, community processes and the new cultural economy', *Cities*, 31, 69-75.
- Tu J.J.,Tang J.J.,Zhang Q.,Wu Y., &Luo Y.C. (2019). 'Spatial heterogeneity of the effects of mountainous city pattern on catering industry location', *Acta Geographica Sinica*(06),1163-1177.
- Wu T.H. (1997). 'Pursuing the soul of the city', *City Planning Review*(03),25-28.
- Huang L. (2010). 'A Study on Cultural Structure of UrbanSpace with the Case Study of Cities inSouthwest China(Ph.D. Dissertation, Chongqing University)', *Ph.D.*,
https://kns.cnki.net/kcms2/article/abstract?v=gpYIZH45TFni2rJD5Sdp92yT8zaL2DDkdP9DyB5KPK7yY0DnZbjy60YHTXyyTqOgRjLFdkrb_ECtoczFs4OUtkGwUQSuA1DI5zD6d17vAYs6HcbUn5JwEVTFW1UZVdXhU46C2mfGq8Lq9gcTVet3386Qn3j2S2Oe6FFhwXu6I35xNRXcyB8CBwsy0N2aW2EX&uniplatform=NZKPT&language=CHS
- Huang H. (2006). 'Cultural-policy-led Urban Regeneration: Experience and Inspiration of Development of Western Cities Based on Cultural Resources', *Urban Planning International*(01),34-39.
- Wang C.F. (2017). 'Research on the Optimization of urbanCultural Spatial Structure under theBackground of Cultural Consumption——A case of the main city of

- Chongqin(Master's thesis, Chongqing University)', *Master*,
https://kns.cnki.net/kcms2/article/abstract?v=gpYIZH45TFIAMA7jBLPtsEYCHBeNTk7drzwvBvhULEVzjKK0QPbDIukzR00Ks8d_zX1NLLZZUnjcRel6yq1ZMsqqe89Y_JCcpnPkdZyUbaUJr_wFOWbA-PhX8KQrxTAORQ9TA53TIFPL2mU7WtsAN8hiud2ECDFXQnV8EY-ly1H3pPCDWrbTDUZ5F98JdNZvuaNE7GUQIE=&uniplatform=NZKPT&language=CHS
- Gao L.(2018). 'Public Participation in London City Planning: A Home for All Londoners', *Urban Planning Forum*(01),124-125.
- Chen D.J.(2019). 'Characteristics and Gene Analysis of SpatialMorphology Types in Historic District ofChongqing——Based on The Scale of Blocks And Building(Master's thesis, Chongqing University)', *Master*,
<https://link.cnki.net/doi/10.27670/d.cnki.gcqdu.2019.001752doi:10.27670/d.cnki.gcqdu.2019.001752>.
- Schmitt, B. (1999). 'Experiential marketing', *Journal of marketing management*, 15(1-3), 53-67.
- Hu Y.T.(2015). 'Cultural experience of ChongQingpedestrian commercial streets(Master's thesis, Chongqing University)', *Master*,
https://kns.cnki.net/kcms2/article/abstract?v=gpYIZH45TFnDI5HwAl9orlCL7HAlvZy-PbruQrXNhEW_i3ImpKGa-azTQ2RTSEle2YAAyuKmDvah4W00u6r18EICwmWVm5GTA1DQNWXLyBhbgmt1_IYYA DSAA_V3vYSUjZEMtPfSvAckErde1loZsgrNuRwiBpBK-ZGxTzBimuGz9hdaZsvbdkl0qWinDwrAFMqbwaeU=&uniplatform=NZKPT&language=CHS
- Pei Y.X.(2017). 'The Structure, Features and Evolution of theimage of Chongqing Yuzhong Peninsula(Master's thesis, Chongqing University)', *Master*,
https://kns.cnki.net/kcms2/article/abstract?v=gpYIZH45TFItphl4vsj6fMpAbtRf2a6JFGsiImJ0IPxOtayG9eEGdSrluynonV-h4XFU_mNqV2N8xaFyGh_FwpfoZEosMbry05n5Nd7t8oBc4lp1lQod-XT8lkNUjTVniMxFB21NYZDyQttK5kyj2WiNcW1xcRCHHcJvfoOov3wACN9xjwLlclqKCOpYFCoZ7TgOHPATpjA=&uniplatform=NZKPT&language=CHS
- Wang Jiwu.(2005). 'Study on Urban Space Form with View ofRegional Culture(Ph.D. Dissertation, Chongqing University)', *Ph.D.*,
https://kns.cnki.net/kcms2/article/abstract?v=gpYIZH45TFImrdudOYX6GiT53poZtEOWzpTHSRlhMHDnyuN4MBRcltFhCzZR51ZTrLPvuxXWYu7aEqspjd3lGP84wEnsSpDKeknyjPljasiD7H3Gh-rlsHIBVEaVp9fV0nthy9EZ8vjt76E3wtoCqXyfxdZITqzUqLfmUsgUI-5VI2uhwB_4yi5ouglvZkQ&uniplatform=NZKPT&language=CHS
- Yu W.H.,Ai T.H.,Yang M., & Liu J.P.(2016). 'Detecting“Hot Spots”of Facility POIs Based on Kernel Density Estimation and Spatial Autocorrelation Technique', *Geomatics and Information Science of Wuhan University*(02),221-227.doi:10.13203/j.whugis20140092.
- Zhang J.Q.,Liu Y.N., & Song B.B.(2022). 'Study on the spatial distribution characteristics of life service industry in the main urban area of Zhengzhou city based on POI data', *World Regional Studies*(02),399-409.
- Shen Q.X.,Li C.G., & Liu Q.(2017). 'Urban Spatial Structure by Service Facilities Distribution:A Case in Main Districts of Changchun', *Economic Geography*(03),129-135.doi:10.15957/j.cnki.jjdl.2017.03.017.

- Gan Q.Q.(2021). 'Series connection and optimization of cultural tourist routes in Yuzhong District of Chongqing Based on spatial vitality (Master's thesis, Southwest University)', *Master*, <https://link.cnki.net/doi/10.27684/d.cnki.gxndx.2021.002129doi:10.27684/d.cnki.gxndx.2021.002129>.
- Huang G.Y.(2005). 'ECOLOGICAL THINKING OVER SPATIAL STRUCTURE OF HILLY CITY', *City Planning Review*(01),57-63.
- Duan Y.M.,Liu Y.,Liu X.H., & Wang H.L.(2018). 'Identification of Polycentric Urban Structure of Central Chongqing Using Points of Interest Big Data', *Journal of Natural Resources*(05),788-800.
- Zhang L.J.(2019). 'Study on spatial pattern characteristics and driving factors of catering industry in Chongqing main urban area based on GIS spatial analysis (Master's thesis, Chongqing Normal University)', *Master*, https://kns.cnki.net/kcms2/article/abstract?v=gpYIZH45TFI3iG9YOPNhnIAiD4VvAMzlj8zZ-slVef-ubHw7wQZUMmB-hBNf5obJawohkqgXh6VOEkP5MWJIGZWoRBsAJFYe8rgJfaxrfTC4midnbyhMtAW7fBNQljB4MPfR_uY1H2fnnD8NV6V-SqBE3KrrFP2I92x8qh666BNPQrncAyJo0XpfCrM5EDSV9XJ0ZOpReU4=&uniplatform=NZKPT&language=CHS
- Shu S.Y.,Wang R.,Sun Y.W.,Liu J., & Xiao L.S.(2012). 'Spatial Distribution of Urban Catering Industry and Its Influenced Factors: A Case Study of Xiamen City', *Tropical Geography*(02),134-140.doi:10.13284/j.cnki.rddl.001590.
- Yang F.,Xv J.G., & Zhou L.(2016). 'Cluster Identification and Spatial Characteristics of Catering in Guangzhou based on DBSCAN Spatial Clustering', *Economic Geography*(10),110-116.doi:10.15957/j.cnki.jjdl.2016.10.015.
- Chen L.Q.(2011). 'Urban Culture: the Inner Driving Forces of Urban Development', *Journal of Xihua University (Philosophy & Social Sciences)*(01),108-114.doi:10.19642/j.issn.1672-8505.2011.01.021.
- Zhan Y.S.(2021). 'Research on the cultural image of Chinese cities based on multi source data (Master's thesis, Tianjing University)', *Master*, <https://link.cnki.net/doi/10.27356/d.cnki.gtjdu.2021.003241doi:10.27356/d.cnki.gtjdu.2021.003241>.
- Ning Y.X.(2015). 'Optimization Research on Urban Public Space of High-density Mountainous Cities——Take Yu Zhong peninsula of Chong Qing as an Example (Master's thesis, Chongqing University)', *Master*, https://kns.cnki.net/kcms2/article/abstract?v=gpYIZH45TFkOztdu_oRr8VA4pzM2cY5g1cu5gQu2IJsV6_ugBtKPAL1KC22nDS4KSh5Te27HpNH7JuhrJWRJOp3DtL-cmMcjBRrUKrGXNWHMOC0_wVFtaEECKYqCoJJrjfMkE9IdyMs47tQMB3xILOAfgQYm6FZRdB9rf480u9io0Ndy0f3qw2Akovm9Z_YH7AMQsAvsdpY=&uniplatform=NZKPT&language=CHS
- Luo J.L.(2016). 'Geographical Names and Urban Morphology——Exploring the Culture Connotation、Inheritance and Evolution of Urban Morphology through Geographical Names of Chengdu and Chongqing (Master's thesis, Chongqing University)', *Master*, <https://kns.cnki.net/kcms2/article/abstract?v=gpYIZH45TFklx0tjIOB4Ko6ImrvekenAeGadoXoQz73gQalNunyN12IKhpXN72D->

LG_7mXTaEZwixJLwy3EJ3aV3Nc1K4ScYlW9iSr9FtU9LUzHgFQx7Dz1-
PWW_JaXox6c7uJ8duJvF25qloBjNDTa8vX9PIN3rssKFKejEqynIUMtX1Aveigo_tAdUPoe
Rd71OIPNETU=&uniplatform=NZKPT&language=CHS

AI Methodological Note:

When translating and polishing the paper, advanced artificial intelligence language model Claude 3.5 was used to assist with data analysis, content structuring, and language refinement. Artificial intelligence tools help improve the clarity and coherence of case studies by generating initial drafts and suggesting organizational frameworks. However, all final explanations, conclusions, and editorial decisions are made by the authors to ensure the accuracy and completeness of the research. Careful monitoring was conducted on the use of Claude 3.5 to meet research objectives and maintain the quality of research results.