ISSN 2508-2817 KiDRS Korea Institute of Design Research Society 통권 35호, 2025. Vol.10, No.2

Sound, Symbol, and Space: An Ethnosemiotic Analysis of Vernacular Soundscapes in Honghai Morning Market

소리, 기호, 공간: 홍해 아침시장의 버내큘러 사운드스케이프에 대한 민족기호학적 분석

주 저 자 : 석일선 (Shi,Yi Xuan) 홍익대학교 디자인공예학과 박사과정
syxshiyixuan@126.com

https://doi.org/10.46248/kidrs.2025.2.49

접수일 2025. 05. 16. / 심사완료일 2025. 05. 21. / 게재확정일 2025. 05. 12. / 게재일 2025. 6. 30.

Abstract

This study explores the socio-cultural significance of soundscapes in Chinese street markets, taking the Honghai Morning Market in Northeast China as a representative case. Integrating theories of vernacular culture, soundscape, and ethnosemiotics, the research analyzes how market sounds function as cultural symbols. Data was collected through soundwalks, sound mapping, and direct observation. Through axial coding analysis, market sounds were classified into three categories: performance, navigation, and background sounds. The study focuses on three representative cases: dialect-driven hawking at a tofu stall, live poultry sounds, and mechanical sounds from flame torches used for food preparation. Findings reveal that market sounds are a complex symbolic system embedded with local cultural meanings rather than mere auditory phenomena. These sounds trigger specific behaviors, including capturing customer attention, directing spatial movement, and facilitating social interaction. The Honghai Morning Market's soundscape exhibits diversity, dynamism, and strong local characteristics, contributing to sensory experiences and vernacular cultural expression. The research provides insights for urban public space design, including multi-layered sound planning strategies, sound-behavior interaction systems, and preservation of local soundmarks, and creating spatial environments conducive to sound performances.

Keyword

Soundscape(사운드스케이프), Vernacular Culture(버내큘러 문화), Ethnosemiotics(민족기호학적), Street Market(길거리 시장)

요약

본 연구는 중국 동북 지역 홍해(红海) 아침 시장을 중심으로 길거리 시장 내 사운드스케이프 (Soundscape) 의 사회문화적 의미를 탐구하였으며, 시장 소리가 문화적 기호로 생산되고, 전파되며, 해석되는 방식을 분석하였다. 버내큘러 문화 (vernacular culture) , 사운드스케이프 이론, 민족기호학적 (ethnosemiotics) 관점을 통합하여 시장 소리가 어떻게 문화적 기호로 기능하는지 분석하였다. 데이터 수집은 사운드워킹, 사운드 매핑, 직접 관찰 등의 방법을 활용하였다. 축코딩 분석을 통해 시장 소리를 세 가지 유형으로 분류하였다: 공연 소리, 내비게이션 소리, 배경 소리. 연구는 세 가지 대표적 사례를 중점적으로 분석하였다: 두부 판매대의 방언 호객 소리, 가금류 판매대의 닭 울음소리, 그리고 식품 가공에 사용되는 화염 토치의 기계적 소리. 연구 결과, 시장 소리는 단순한 청각적 현상을 넘어 지역 문화적 의미를 담고 있는 복합적 기호 체계임이 밝혀졌다. 이러한 소리들은 고객의 주의를 끌거나, 공간적 이동을 유도하거나, 사회적 상호작용을 촉진하는 등의 특정 행동을 유발한다. 홍해 조시의 사운드스케이프는 다양성, 역동성, 그리고 강한 지역적 특색을 보여주며, 이는 시장의 감각적 경험을 풍부하게 할 뿐만 아니라 버내큘러 문화의 혁신성과 지역성을 반영한다. 본 연구는 도시 공공공간 설계에 다층적 소리 계획 전략 수립, 소리-행동 상호작용 시스템 설계, 지역 사운드마크 보존 등의 시사점을 제공하여 도시 감각 환경의 질을 향상시키는 데 기여하고자 한다.

목차

1. Introduction

1-1. Research Background and Purpose

Street markets are essential components of urban public spaces. They serve as venues for commodity exchange and as carriers of social interaction, cultural transmission, and collective memory. Rich visual, auditory, and olfactory landscapes provide residents with distinctive multisensory experiences within markets.

Current research on markets has predominantly focused on visual landscapes, while soundscapes—an equally critical aspect of spatial experience—have gradually attracted scholarly attention. With the advancement of sensory anthropology and sensory geography in recent years, scholars have increasingly questioned the limitations of visual-centric approaches and advocated for multisensory research methodologies[1]. As a vital component of urban public space experience, soundscape significantly shapes people's perception of and emotional attachment to urban environments[2]. Research on soundscapes reflects and supplements visual-centered studies, offering a new dimension for understanding urban spaces. Unlike the static nature of visual landscapes, soundscapes are characterized by fluidity, temporality, and interactivity, enabling the capture of subtle changes and social interactions that visual observation often overlooks [3]. Through the study of soundscapes, it is possible to uncover aspects of urban life missed by visual research, such as variations in spatial rhythms, modes of social interaction, and the immediacy of cultural expression. Soundscapes are increasingly recognized as crucial media for spatial construction and cultural transmission[4].

Due to their dense multisensory environments and localized characteristics, markets have become important sites for soundscape research. The Honghai Morning Market, a typical street market in Northeast China, presents a rich and distinctive auditory landscape. This landscape comprises multiple layers of sounds: vendors' hawking calls in the Northeastern dialect; the rhythmic dialogues formed through bargaining; and ambient sounds such as chickens crowing, the chopping of vegetables, the metallic clinking of weighing scales, and the rustling of plastic bags. The soundscape of this market is

1) Howes, D., 『Empire of the Senses: The Sensual Culture Reader』, Oxford: Berg Publishers, 2005,pp.10－17.
2) Kang, J., Aletta, F., Gjestland, T. T., Brown, L. A., Botteldooren, D., Schulte-Fortkamp, B., Lercher, P., van Kamp, I., Genuit, K., Fiebig, A., & Bento Coelho, J. L., 'Ten questions on the soundscapes of the built environment', Building and Environment, 2016, Vol.108, pp.284－294.
3) LaBelle, B., 『Acoustic Territories: Sound Culture and Everyday Life』, New York: Continuum, 2010, pp.5－10.
4) Brown, A. L., & Muhar, A., 'An approach to the acoustic design of outdoor space', Journal of Environmental Planning and Management, 2017, Vol.47, No.6, pp.827－842.

characterized by diversity, dynamism, strong interactivity, and a high degree of localization, reflecting the integration of local culture and everyday practices.

This study combines the concept of vernacular culture with the theoretical lens of ethnosemiotics to analyze the socio-cultural meanings embedded in the market's soundscape. Building upon this research background, this study takes the Honghai Morning Market as a case study and aims to achieve the following three objectives: (1) To explore the market's types, characteristics, and spatial distribution of soundscapes. (2) To analyze the socio-cultural meanings of the market's soundscape from the perspective of ethnosemiotics, revealing how sounds are produced and transmitted as cultural symbols within the market space; (3) To derive insights from the study of the market's soundscape that can inform the design of urban soundscapes.

1-2. Research Scope and Methodology

The Honghai Morning Market is situated along a street in a city in northern China, adjacent to residential areas and a school, and has been operating continuously for approximately 30 years(Figure 1). The market opens daily from 5 a.m. to 8 a.m., stretching approximately one kilometer along the street, thus forming a substantial temporary commercial space. The market primarily sells various food products and daily necessities, most of which are grown, caught, or handmade by vendors, creating a rich and diverse multisensory landscape(Figure 2). Established spontaneously by residents, the market exhibits clear bottom-up characteristics. Historically, the market faced threats of closure by local authorities due to traffic obstruction concerns, and officials attempted to relocate and standardize its operations. However, collective resistance by residents successfully preserved the market at its original location. This experience has positioned the Honghai Morning Market not only as a vital component of the local economy and community life, but also as an exemplar of community resistance to governmental standardization, reflecting the resilience of traditional market culture and the community's capacity for self-governance.

Figure 1. Map of Honghai Morning Market

Figure 2. Various products. Photo by the author(2025).

Taking the Honghai Morning Market as a research scape, this research focuses on the exploration of sensory characteristics, spatial distribution, and socio-cultural interactions embedded within its soundscape. To collect comprehensive and detailed data, the researcher conducted multiple in-depth investigations of the market throughout the year. The research methods included: (1) Soundwalks, employing professional audio-recording equipment (ZOOM H6) to document spatial distribution and acoustic features of sounds, further visualized through sound mapping; (2) Photography and direct observation are used to capture immediate behavioral responses triggered by sounds; (3)

Semi-structured interviews, conducted to gain deeper insights into the cultural meanings and social interactions involved in sound production and reception.

2. Theoretical Framework

This study integrates three theoretical perspectives: vernacular culture, soundscape theory, and ethnosemiotics. This framework addresses not only the physical properties and types of sounds but also their cultural production processes and symbolic meanings.

2-1. Vernacular Culture

"Vernacular culture" refers to non-professional cultural forms spontaneously generated by community members through everyday practices within specific localized contexts. It is characterized by locality, informality, and creativity. In studying urban cultural spaces, vernacular culture offers a lens to understand the relationship between locality, everyday life, and cultural dynamics.

In this study, "vernacular culture" refers explicitly to the cultural phenomena created by market participants through local dialects, simple tools, and localized expressions in their daily lives. Traditional markets are among the most representative sites of vernacular culture. Pennycook and Otsuji, in their research on linguistic practices in markets, pointed out the phenomenon of "metrolingual flexibility," wherein participants flexibly utilize multiple linguistic resources according to practical needs[5].

At the Honghai Morning Market, vernacular culture is mainly manifested in three aspects: (1) Local dialects and rhythms: The hawking calls in the Northeastern dialect form the most distinctive sound markers of the market, conveying product information and embodying local cultural characteristics. (2) Improvised sound-making tools: Vendors creatively use available objects, such as metal scales, bamboo baskets, and plastic bags, to produce unique auditory signals, demonstrating resourceful adaptation to limited means. (3) Localized patterns of sonic interaction: Specific rhythms of bargaining, greeting practices, and modes of auditory response have developed within the market, constituting a localized system of sound-based communication. Analysing vernacular culture in markets requires attention to its dynamic and evolving processes, rather than treating it as a static artefact. This perspective allows for understanding market sounds as community-generated cultural practices, rather than mere acoustic phenomena.

2-2. Soundscape Theory

The concept of soundscape was first proposed by Canadian scholar R. Murray Schafer, who identified three categories of sounds: sound signals, soundmarks, and keynote sounds. Keynote sounds refer to continuous background noises within the environment, such as wind, water, or persistent urban hums. Sound signals are foreground sounds that capture attention, such as alarms, shouts, or announcements. Soundmarks are distinctive sounds unique to a particular locale, functioning similarly to visual landmarks[6]. Truax, in his work Acoustic Communication, further developed Schafer's theory by proposing that sounds are not merely passive elements of the environment but also active media that construct social meanings[7]. In recent years, scholars have refined the categorization of urban sounds. For example, Quercia et al. analyzed social media data. They

5) Pennycook, A., & Otsuji, E., 『Metrolingualism: Language in the City』, New York: Routledge, 2015, pp.6.

6) Schafer, R. M., 『The Soundscape: Our Sonic Environment and the Tuning of the World』, Rochester, VT: Destiny Books, 1994, pp.9-11.

7) Truax, B., 『Acoustic Communication (2nd ed.)』, Westport, CT: Ablex Publishing, 2001, pp.19-21, 65.

proposed a more detailed urban sound classification system, identifying six categories: natural sounds, music, human activity sounds, indoor social sounds, traffic sounds, and mechanical sounds[8].

Applying soundscape theory aids in identifying and organizing the types and characteristics of market sounds. This study draws on the classification models proposed by Schafer and Quercia to develop a tailored categorization of the soundscape within the market context.

2-3. Ethnosemiotics

The theory of ethnosemiotics was initially articulated by Greimas and Courtés, who defined it as the study of "how cultural symbols are created, transmitted, and understood within specific groups."[9] Ethnosemiotics integrates semiotic analysis with anthropological methods to explore how particular social groups construct and express meaning through symbolic practices.

In recent research, Felbacq further described ethnosemiotics as a method for "studying systems of signs that emerge from local knowledge and practices," with particular attention to symbols spontaneously created by specific communities in everyday life[10].

This study applies the perspective of "sound as cultural symbol" from ethnosemiotic theory to understand the socio-cultural processes through which sounds in the market are produced, transmitted, and interpreted. Ethnosemiotics allows us to see that the sounds in Honghai Morning Market are not merely physical phenomena but function as symbolic systems embedded with specific cultural meanings. Through this lens, the study analyzes how particular groups assign symbolic meanings to sounds and how these sounds participate in cultural production and communication.

This research integrates vernacular culture, soundscape theory, and ethnosemiotics to construct a comprehensive theoretical framework. This framework supports analyzing the types, characteristics, spatial distribution, and socio-cultural meanings of the Honghai Morning Market soundscape, attending to the material and perceptual attributes of sounds and their symbolic and cultural functions.

3. Collection and Analysis of the Soundscape at Honghai Morning Market

3-1. Sound Data Collection

The data collection methods employed in this study included soundwalks, sound mapping, direct observation, and photography. The auditory data collected covered sound types, durations, frequencies, volumes, pitches, and the behaviors or events triggered by specific sounds.

Soundwalks refer to a research method in which the researcher actively participates in and experiences the sound environment, capturing the spatial distribution and variations of sounds through movement. This method was originally introduced by Schafer (1977) as part of the World Soundscape Project and was later further developed and refined by Westerkamp[11]. In this study, the soundwalk method enabled the researcher to: Capture and experience the temporal and spatial dynamics of market sounds; observe the immediate evolution of the soundscape. The researcher designed a route

8) Quercia, D., Aiello, L. M., Schifanella, R., & Davies, A., 'Chatty maps: Constructing sound maps of urban areas from social media data', Royal Society Open Science, 2016, Vol.3, No.3, pp.3.

9) Greimas, A. J., & Courtés, J., 『Semiotics and Language: An Analytical Dictionary』, Bloomington, IN: Indiana University Press, 1982, pp.68－70,

10) Felbacq, D., 'Ethnosemiotics: Signs emerging from local knowledge and practices', Semiotica, 2019, Vol.2019, No.230, pp.43－59.

11) Westerkamp, H., 'Soundwalking', In A. Carlyle (Ed.), 『Autumn Leaves: Sound and the Environment in Artistic Practice』, Paris: Double Entendre, 2006, pp. 49－54.

that covered the entire market and conducted multiple sound walks along this pre-defined path. Each walk lasted approximately 40 minutes and was conducted during different periods (market opening, peak hours, and pre-closure) and across different areas. Sound recordings were made using a ZOOM H6 professional audio recorder, while the locations, times, and environmental contexts of sound events were simultaneously documented.

Direct observation refers to a research method in which the researcher personally records and analyzes the behaviors and phenomena of subjects within the field setting. The strength of this method lies in its capacity for direct recording of behaviors and high fidelity to environmental realities; however, its accuracy may be influenced by observer bias, the recording process, and the conditions under which observations are conducted[12]. In this study, direct observation enabled the researcher to personally experience and document detailed environmental features and behavioral interactions within the market. Direct observation was implemented through the following procedures: (a) regular market visits (2-3 times per week, each lasting approximately one hour); (b) direct participation in market activities, such as shopping interactions, observing communication between vendors and customers, and experiencing the sensory environment; (c) systematic documentation, including field notes focusing on sensory experiences.

Photography played an essential role in the soundscape research, particularly in documenting the spatial settings and social contexts associated with sound events. As Pink noted, photography is not merely a recording tool but also a research method that allows for deeper engagement with visual culture[13]. In soundscapes research, visual documentation helps establish connections between sound, space, and behaviour[14]. This study employed photography for three main purposes: recording the physical spaces and environments where sounds were produced; capturing behavioral reactions triggered by sound events; and documenting the material tools and technologies involved in sound production.

Regarding research ethics, informed consent was obtained from participants before recording and photography activities. During the data collection process, particular care was taken to minimize disruption to the daily operations of the market, ensuring that the research activities did not interfere with vendors' business activities or customers' shopping experiences.

3-2. Sound Data Coding and Analysis

This research through soundwalk identified various sounds in the market, including human voices, mechanical noises, animal sounds, tool-use sounds from human activities, cooking sounds, vehicle movements, honking, and environmental noises. Drawing on Schafer's soundscape theory and applying axial coding, the sounds of the market were categorized into three main types: performance sounds, navigation sounds, and background sounds.. Performance sounds include vendors' hawking calls to attract customers and the sounds produced during food preparation. Vendors deliberately generate these sounds to capture customer attention and often feature the distinct characteristics of the Northeastern dialect, such as rising intonations and pronounced rhythmic patterns. They are typically accompanied by facial expressions and hand gestures, forming a

12) Repp, A. C., Nieminen, G. S., Olinger, E., & Brusca, R., 'Direct observation: Factors affecting accuracy and interobserver agreement', Exceptional Children, 1988, Vol.55, No.1, pp.29-36.

13) Pink, S., 『Doing Visual Ethnography (3rd ed.)』, London: SAGE Publications, 2013.

14) McCartney, A., 'Soundwalking: Creating moving environmental sound narratives', In Gopinath, S., & Stanyek, J. (Eds.), 『The Oxford Handbook of Mobile Music Studies, Volume 2』, Oxford: Oxford University Press, 2014, pp. 212-237

complete communicative system. Navigation sounds help customers orient themselves within the market space. Examples include the crowing of chickens and ducks in the live poultry section, the splashing of water in the seafood section, and distinctive hawking phrases or mechanical sounds associated with specific stalls. These sounds are repetitive and rhythmic, helping to establish associative memories between sounds and spatial locations. Background sounds form the fundamental auditory environment of the market, encompassing general conversations among people, transaction noises, ambient sounds, and seasonal auditory elements. These non-directional sounds create the unique auditory atmosphere of the market, reflecting its level of busyness and periods of peak activity.

Through observation, this study found that market sounds triggered two main categories of behavioral responses: customers' immediate perceptual reactions and vendors' strategic uses of sound. Customers' immediate responses included bodily orientation adjustments (such as turning heads, pausing, or glancing), spatial movement behaviors (such as approaching the sound source or altering walking paths), and the initiation of social interactions (such as conversing with companions or engaging vendors). These behaviors align with Truax's (2001: 24) description of "acoustic orientation," where individuals adjust their actions based on the spatial characteristics of sounds. Vendors' strategic sound use involved increasing the frequency and volume of hawking calls during periods of high foot traffic to attract customer attention.

In this study, the sound data collected from the market were visualized through the creation of a sound map. A sound map is a method that links auditory information to specific spatial locations and presents it visually, serving as a tool for understanding the spatial distribution of sounds. The sound map shown below depicts the soundscape of the Honghai Morning Market recorded on the morning of February 18, with a total recording duration of 44 minutes and 17 seconds. The audio files were imported into Adobe Audition software to extract decibel levels for analysis. Although the recordings covered the entire one-kilometer stretch of the market, the sound map highlights 12 representative sound sources. These sources were selected based on their typicality, distinctive acoustic characteristics, and spatial distribution patterns. In this research, the sound map integrates keynote sounds, sound signals, markers, decibel values, and corresponding visual information. These sound maps document the variations and rhythms of sounds within the market space, providing a direct and intuitive basis for understanding the spatial structure of the market's soundscape (Figure 3). Among the recorded sounds, vendor hawking calls were the most frequently observed, followed by tool-generated sounds, and then animal vocalizations.

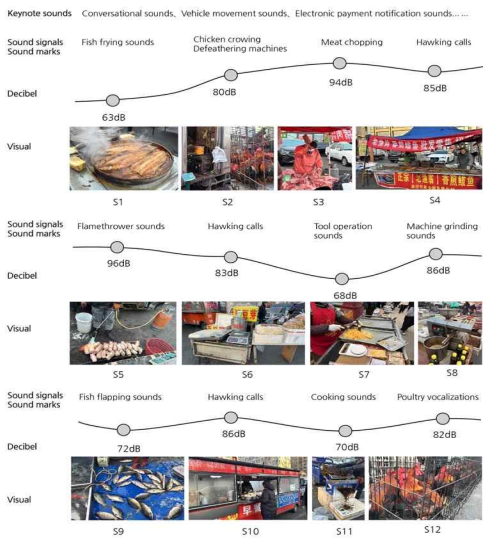

Figure 3. Sound map of the Honghai Morning Market. Designed by the author(2025).

4. Case Studies of the Soundscape

This chapter analyzes three representative sources of sound drawn from the categories of performance and navigation sounds, encompassing human voices, animal sounds, and mechanical tool sounds. The selection of the following cases is based on the following

reasons: the high frequency of hawking in the local dialect; the live poultry stall where the products autonomously produce sounds; and the distinct and recognizable sound of a blowtorch.

4-1. Soybean products stall

In the central area of the market, hawkers call out such items as “Come, tofu, dried tofu, soy milk, tofu pudding, frozen tofu, fresh bean sprouts”, emanating from a stall located at a crossroads. This stall specialized in various soybean products, including large tofu blocks, dried tofu, soy milk, tofu pudding, frozen tofu, and bean sprouts (Figure 4). The vendor primarily attracted customers through loud and clear hawking calls. Frequent and natural conversations occurred between vendors, customers, and neighboring stallholders, covering price inquiries, purchases, and casual chatting. In addition, distinctive tool sounds and digital payment notification sounds were present, such as opening and closing an iron pot lid, handling goods, friction of plastic bags, and WeChat payment alerts. Background sounds included vehicle honking and general crowd conversations within the market.

Figure 4. Soybean product stall. Photo by the author(2025).

Analysis of the sound recordings revealed that the vendor’s hawking calls occurred 24 times over a 40-minute and 21-second observation period, lasting approximately four seconds. The calls displayed a clear temporal pattern: during the first 15 minutes, hawking occurred every 9-15 seconds, while in the subsequent 25 minutes, the frequency increased significantly to every 3-6 seconds. This shift was closely related to the approaching market closure and inventory levels, indicating the vendor’s adaptive adjustment of hawking behavior in response to real-time conditions. Soundwave analysis showed that the hawking calls had high amplitude with distinct peaks, and a rising intonation at the end of each phrase.

The content of the hawking calls could be classified into two main types: “Come, tofu, dried tofu, soy milk, tofu pudding, frozen tofu, fresh bean sprouts”, and “Pure brine tofu, gaga good.” The former occurred more frequently and dominated the hawking content, while the latter incorporated the Northeastern dialect expression "gaga" (meaning extremely good), highlighting a local cultural feature. Compared to hawking calls, conversational sounds were softer, had a moderate frequency, and varied in duration from brief to moderate (3-48 seconds). These sounds had medium amplitude and relatively smooth waveforms. Although tool sounds occurred less frequently, each instance was distinctly audible with medium to high amplitude; WeChat payment alerts were loud and featured pronounced waveform peaks. Vehicle honking was louder in the background sound layers, while crowd conversations were gentler, creating a multi-layered soundscape structure.

The use of the Northeastern dialect term "gaga" in hawking reflects Aiello et al.’s (2016) concept of "socio-cultural sounds," where sounds serve not only as carriers of information but also as markers of cultural identity. Moreover, hawking calls as a form of sound communication functioned symbolically in facilitating market activity. During the observation period, the vendor’s hawking directly attracted 11 customers, five of whom made immediate purchases following the hawking calls, illustrating the direct utility of sound in market economic activities. Additionally, the functional role of sounds was evidenced by the clear, recurring tool sounds (such as the pot lid opening) and digital

payment alerts, marking the completion of transactions and triggering two main categories of behavioural responses: customers' immediate perceptual reactions and vendors' strategic uses of sound. Customers' immediate responses included bodily orientation adjustments (such as turning heads, pausing, or glancing), spatial movement behaviors (such as approaching the sound source or altering walking paths), and the initiation of social interactions (such as conversing with companions or engaging vendors). These behaviors align with Truax's (2001: 24) description of "acoustic orientation," where individuals adjust their actions based on the spatial characteristics of sounds. Vendors' strategic sound use involved increasing the frequency and volume of hawking calls during periods of high foot traffic to attract customer attention better.

4-2. Poultry Stall

Intermittent chicken crowing can be heard when approaching the eighth stall on the right-hand side of the first street at the Honghai Morning Market. These vocalizations are often accompanied by mechanical sounds—metal cutting noises, the continuous roaring of a defeathering machine, clanging of iron tools, and the rustling of plastic bags (Figure5) . This stall specializes in selling live chickens and provides defeathering and butchering services (Figure6) . A row of cages filled with live poultry is placed at the front of the stall, while defeathering equipment and iron pots are positioned at the back. A delivery truck adjacent to the stall houses a defeathering machine and a chopping station.

The two most prominent sound sources at this stall are the chicken crowing and the roaring of the defeathering machine. The chicken crowing can be categorized into two types: high-decibel and low-decibel calls. High-decibel crowing occurred 48 times during the observation period, mainly in three stages: when the chickens were removed from cages, during weighing, and immediately before slaughter. These calls exhibited distinctive acoustic features: high amplitude, clear waveform peaks, and short durations of 1-2 seconds, totalling approximately 83 seconds of cumulative crowing. The frequency of these vocalizations generally ranged from 2000 to 4000 Hz, granting them strong penetrative power, and making them distinctly recognizable even within the noisy market environment. In contrast, low-decibel crowing—brief chicken calls of about 0.4 seconds each—occurred sporadically. Meanwhile, the defeathering machine was activated three times, each operation lasting approximately four minutes, resulting in 12 minutes of sustained, high-amplitude background noise (approximately 75-85 decibels).

The chicken crowing was not merely an instinctual animal behavior; it also served as an expression of local culture within the market environment, forming an auditory marker of "freshness" and "liveness." These sounds were integrated into residents' sensory experience systems, functioning as auditory cues for assessing food quality. As Feld observed in his studies on the anthropology of sound, Community members develop specific interpretive frameworks for sounds through shared auditory experiences over time[15]. The high-decibel crowing observed during the removal, weighing, and pre-slaughter stages (48 instances totalling 83 seconds) marked key stages of the commercial transaction. They served as an "authenticity marker" within the marketplace soundscape. As Martinelli pointed out, "Animal sounds are recontextualized within human social settings as cultural symbols[16]." Through this process of semiotic transformation, chicken

15) Feld, S., 'Acoustemology', In D. Novak & M. Sakakeeny (Eds.), 『Keywords in Sound』,Durham, NC: Duke University Press, 2015, pp.12-21.

16) Martinelli, D., 『Give Peace a Chant: Popular Music, Politics, and Social Protest』, Cham: Springer International Publishing, 2017.

crowing shifts from being a natural signal to a cultural marker of food quality.

Figure 5. Poultry Stall. Photo by the author(2025).

Figure 6. Poultry. Photo by the author(2025).

4-3. Flamethrowing Pork Trotters Stall

On the left side of the Honghai Morning Market, near the central area, a distinctive "shhh—shh-shh" sound can be heard. This sound stands out clearly within the market environment due to its high frequency, sustained nature, and strong directionality. The flamethrower's sonic patterns consist of two primary types: a continuous hissing sound during steady flame emission and intermittent bursts during controlled operations. The flamethrower noise is interwoven with brief vendor-customer dialogues, bargaining exchanges in local accents, and sporadic background sounds such as the rustling of plastic bags and the clinking of weights on scales, creating a complex auditory landscape. This sound source originates from a stall selling pork trotters (Figure7). Upon approaching the stall, one can observe the vendor using a high-pressure flamethrower directed at the pork trotters. The flame rapidly sweeps across the surface of the pigskin, producing a bright visual effect and dynamically shifting fire patterns. Flamethrowing is not cooking the pork trotters directly but removing the residual hair on the skin and damaging the sweat glands, thereby reducing greasiness. This process enhances the pork trotters' flavour and facilitates further consumer preparation.

According to a 42-minute and 17-second audio recording, each flamethrower operation typically lasted 20-30 seconds, with operational intervals of approximately 6-10 seconds. The sound frequency was within the 2000-4000 Hz range—an area the human ear is sensitive to, making the sound easily identifiable and locatable even in the bustling market environment. Acoustically, the flamethrower sounds exhibited stable intensity, a single dominant frequency, and slight tonal variation, characteristics produced by the physical process of gas being expelled and ignited at high speed through a nozzle. This mechanical sound starkly contrasts with the human and animal sounds prevalent in the market, as it originates from tool operation rather than biological vocalization.

The flamethrower used by the vendor exemplifies the vernacular culture of creative adaptation using everyday materials. The vendor employed a long-handled blowtorch connected via a yellow rubber hose to a domestic gas cylinder, with a simple metal mesh frame as the roasting platform (Figure 8). This improvisational yet functional setup demonstrates the practical ingenuity of market participants in resource-limited conditions. It is particularly suited for processing pork trotters—a traditional winter staple in Northern Chinese markets.

Figure 7. Flamethrowing Pork Trotters. Photo by the author(2025).

Figure 8. Flamethrower Tools. Photo by the author(2025).

From an ethnosemiotic perspective, the blowtorch sound constitutes a distinctive "sound mark," as Schafer defines it: "a sound with specific local significance recognized and valued by the community." Through its strong, repetitive physical characteristics, this sound conveys multilayered cultural messages to customers: the flamethrower noise symbolizes a commitment to freshness and highlights the Honghai Morning Market's emphasis on immediacy in food preparation. This interpretation aligns with Aiello et al.'s [17]notion that "human activity sounds reflect the cultural identity of spaces."

4-4. Soundscape and Design Insight

Analysis reveals that the soundscape of the Honghai Morning Market is characterized by diversity, dynamism, strong interactivity, and localization (Table1). The soundscape within the market demonstrates significant pluralism. By identifying the components of the market's soundscape and analyzing their characteristics and socio-cultural meanings, valuable insights can be drawn for the design of urban soundscapes. First, it is crucial to establish a multi-layered sound planning strategy. Performance sounds, navigation sounds, and background sounds should be systematically integrated to create a stratified auditory environment. Specific approaches include: Identifying and preserving local soundmarks (e.g., hawking calls in local dialects, traditional craft sounds); Predefining functional sound zones, such as "sound focal areas," "sound navigation corridors," and "sound buffer zones"; Considering seasonal variations in sounds and reserving flexibility for dynamic adjustments in design. Second, attention should be paid to the construction of sound-behavior interaction systems. The study finds that sounds can trigger specific behavioral responses, offering opportunities to guide spatial experiences and promote social interactions. Designers should coordinate sound with spatial form, carefully considering how architectural shapes, materials, and layouts influence sound propagation. Strategically incorporating sound elements at key nodes can help guide pedestrian flow or reinforce spatial identity. In addition, designing interactive sound installations can enhance the social functionality of public spaces. Third, it is important to protect and revitalize cultural symbolic sounds. Strategies include: Establishing a "sound heritage inventory" to preserve distinctive local sound elements; Allocating spaces within commercial areas that are suitable for sound performances; Reinterpreting traditional sound symbols within contemporary design frameworks to achieve innovative transmission of sound culture.

17) Aiello, L. M., Quercia, D., Schifanella, R., & Aletta, F., 'Chatty maps: Exploring the relationship between urban soundscape and perceptions of quietness', Proceedings of the 25th International Conference on World Wide Web (WWW '16), 2016, pp.31–35.

Table 1. Soundscape of Honghai Moring Market

Sound Category	Sound Types and Specific Examples	Functions and Acoustic Features	Socio-cultural Meanings	Spatial Distribution
Performance Sounds	Hawking Calls (Vendor calls in Northeastern dialect)	Rising intonation, distinct rhythm	Local identity, cultural symbolism	Main market aisles, high-traffic areas
	Food Preparation Sounds (Meat chopping, blowtorching pork trotters)	Strong rhythm, easily recognizable	Handmade craftsmanship, "freshly made" culture	Cooked food area, barbecue and pork stalls
Navigation Sounds	Live Poultry Calls (Crowing of chickens and ducks)	Repetitive, regular, easily identifiable	Impression of freshness, local food culture	Live poultry sales area
	Water Sounds in Seafood Area (Splashing water)	Continuous, spatial markers	Fresh-food culture, symbol of "freshness"	Seafood area
	Mechanical Sounds (Defeathering machines, weighing scales clinking)	Continuous, mechanical, functional identifiers	Daily processing culture, technology application	Poultry and meat stalls, weighing stalls
	Characteristic Slogans (Distinctive stall advertising phrases)	Repetitive, memorable, brand identification	Stall branding, cultural memory marker	Fixed specialty stalls
Background Sounds	Conversational Sounds (Vendor-customer dialogues, pedestrian chats)	Continuous, social	Everyday social interaction, sociable atmosphere	Entire market, crowded areas
	Transaction Sounds (Plastic bag rustling, handling coins/change)	Brief, markers of transaction process	Daily trading culture	Frequently traded areas
	Traffic Noises (Vehicle movements, honking)	Continuous, external background	Interaction between market and external environment	Peripheral market streets
	Environmental Sounds (Wind, leaves rustling, bird calls)	Continuous, low intensity, seasonal	Connection to natural environment, seasonal perception	Market periphery and green areas

5. Conclusion

This study investigated the soundscape of traditional markets through the case of the Honghai Morning Market, employing the perspectives of vernacular culture and ethnosemiotics. Utilizing methods including soundwalks, sound mapping, direct observation, and semi-structured interviews, the study systematically analyzed the types, characteristics, spatial distribution, and socio-cultural meanings of sounds within the market, revealing how sounds are produced, transmitted, and interpreted as cultural symbols in the market environment. The findings indicate that the soundscape of the Honghai Morning Market exhibits a complex multi-layered structure, comprising three main categories of sounds: performance sounds, navigation sounds, and background sounds. From an ethnosemiotic perspective, market sounds carry rich socio-cultural meanings. Hawking calls in the Northeastern dialect serve as vocal markers of regional culture, transmitting not only product information but also reinforcing a sense of local identity among market participants; Live poultry vocalizations act as auditory proofs of "freshness," symbolizing food quality within local culinary traditions; Blowtorch sounds demonstrate vernacular innovation in tool use within the market context. Together, these sounds construct a symbolic system that reflects local knowledge and cultural values.

The study also found that market sounds trigger specific behavioral responses, including customers' shifts in attention, spatial movements, and initiation of social interactions, as well as vendors' strategic adjustments of sound use. This sound-behavior relationship forms a unique interactional pattern within the market, directly influencing both the efficiency of commercial transactions and the quality of social engagements. This study concludes that the soundscape of the Honghai Morning Market is characterized by diversity, dynamism, strong interactivity, and localization. Within the market environment, sounds are not merely auxiliary tools for commercial activities but also vital media for constructing social relationships and transmitting cultural meanings. Based on these findings, this study offers insights for urban public space design, emphasizing the importance of: Developing multi-layered sound planning strategies; Designing sound-behavior interaction systems; Protecting and revitalizing cultural symbolic sounds within urban soundscape. However, this study also acknowledges certain limitations. Although visual observation helped supplement the documentation of sounds, it may have inadvertently influenced the collection and interpretation of auditory data. Future research could expand upon these findings by integrating other sensory modalities to analyze the multisensory landscapes of markets more comprehensively.

References

1. Feld, S., 'Acoustemology', In D. Novak & M. Sakakeeny (Eds.), 『Keywords in Sound』, Durham, NC: Duke University Press, 2015
2. Greimas, A. J., & Courtés, J., 『Semiotics and Language: An Analytical Dictionary』, Bloomington, IN: Indiana University Press, 1982.
3. Howes, D., 『Empire of the Senses: The Sensual Culture Reader』, Oxford: Berg Publishers, 2005.
4. LaBelle, B., 『Acoustic Territories: Sound Culture and Everyday Life』, New York: Continuum, 2010.
5. Martinelli, D., 『Give Peace a Chant: Popular Music, Politics, and Social Protest』, Cham: Springer International Publishing, 2017.
6. McCartney, A., 'Soundwalking: Creating moving environmental sound narratives', In Gopinath, S., & Stanyek, J. (Eds.), 『The Oxford Handbook of Mobile Music Studies, Volume 2 』, Oxford: Oxford University Press, 2014
7. Pennycook, A., & Otsuji, E., 『Metrolingualism: Language in the City』, New York: Routledge, 2015.
8. Pink, S., 『Doing Visual Ethnography (3rd ed.)』, London: SAGE Publications, 2013.
9. Schafer, R. M., 『The Soundscape: Our Sonic Environment and the Tuning of the World』, Rochester, VT: Destiny Books, 1994.
10. Truax, B., 『Acoustic Communication (2nd ed.)』, Westport, CT: Ablex Publishing, 2001.
11. Westerkamp, H., 'Soundwalking', In A. Carlyle (Ed.), 『Autumn Leaves: Sound and the Environment in Artistic Practice』, Paris: Double Entendre, 2006
12. Aiello, L. M., Quercia, D., Schifanella, R., & Aletta, F., 'Chatty maps: Exploring the relationship between urban soundscape and perceptions of quietness', Proceedings of the 25th International Conference on World Wide Web (WWW '16), 2016.
13. Brown, A. L., & Muhar, A., 'An approach to the acoustic design of outdoor space', Journal of Environmental Planning and Management, 2017

14. Felbacq, D., 'Ethnosemiotics: Signs emerging from local knowledge and practices', Semiotica, 2019

15. Kang, J., Aletta, F., Gjestland, T. T., Brown, L. A., Botteldooren, D., Schulte-Fortkamp, B., Lercher, P., van Kamp, I., Genuit, K., Fiebig, A., & Bento Coelho, J. L., 'Ten questions on the soundscapes of the built environment', Building and Environment, 2016

16. Quercia, D., Aiello, L. M., Schifanella, R., & Davies, A., 'Chatty maps: Constructing sound maps of urban areas from social media data', Royal Society Open Science, 2016

17. Repp, A. C., Nieminen, G. S., Olinger, E., & Brusca, R., 'Direct observation: Factors affecting accuracy and interobserver agreement', Exceptional Children, 1988

18. Thompson, E. A., 'Mapping urban soundscapes: acoustic territories and urban experience', Landscape Research, 2017

19. snazzymaps.com/