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Comparative Analysis of Form and Compass Schools in Feng Shui Architecture

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ABSTRACT

This study examines the relationship between different approaches to Feng Shui architecture, beginning with the origin of Feng Shui architecture in the Zhou and Qin Dynasties and the influence of Confucianism and Daoism. We then compare the Form and Compass Schools of Feng Shui architecture, providing insights into the design principles and spatial form analysis of traditional courtyard houses in Chaoshan and Beijing, China. This study emphasizes the need for a comprehensive understanding of Confucianist and Daoist principles in architectural practices and identifies their design criteria, safety factors, and sustainability aspects. DepthmapX software was used to analyze spaces of social interactions in Beijing courtyard houses, revealing the dynamics of social interactions within the architectural layout. The Compass School, which incorporates *bāguà* and *bāzì*, gained prominence in the early Republic of China due to its incorporation of *bāzì* and more systematic analyses. Both the Chaoshan and Beijing courtyard houses follow Confucianist principles but differ in their execution approaches. The Chaoshan house design aims for a single balanced environment, whereas Beijing houses use multiple layers of balance and incorporate secondary walls and entrances to combat harsh winter climates. The Compass School's use of Yin and Yang, along with the Five Elements, employs energetically aligned spaces that promote well-being and harmony, a concept less emphasized in the Form School.

Keywords: Feng Shui architecture, Form and Compass schools of Feng Shui, Yin Yang, spatial analysis, courtyard houses

INTRODUCTION

This paper addresses several research problems in the study of Feng Shui architecture, including insufficient comparative analysis of philosophies, unclear design principles, missing historical contexts, inadequate use of spatial analysis tools, overlooked climate adaptation strategies, and unexamined cultural and social hierarchies (ZiKai Jin, 2021). It identifies the need for more detailed comparisons of the influences of Daoism (Zhang, 2016) and Confucianism (Rong & Azizi, 2023), and more comprehensive understanding of the Form School's principles. The paper also highlights the need for more detailed reporting on potential spatial analysis tools, strategies for climate adaptation, and the influence of cultural and social hierarchies on traditional courtyard house design (Zhang et al., 2023).

To address these research problems, we first explore the historical evolution of design principles from the Zhou to the Han dynasties and the impact of spatial arrangements on social and visual interactions. We then investigate the philosophical foundations of Feng Shui architecture, focusing on the Form School and Compass schools (Paulston & Bennett, 2012). We examine the differences and similarities between these schools and their impact on architectural design. We draw on innovative spatial analysis tools such as DepthmapX to analyze social interactions and spatial dynamics in traditional Feng Shui architecture (DepthmapX Development Team, 2017). Finally, we investigate the adaptation of traditional architectural designs to climatic conditions and the role of cultural and social hierarchies in the design and spatial organization of traditional Chinese courtyard houses. This study thus provides a comprehensive overview of the principles and practices of traditional Chinese architecture as exemplified in courtyard houses, highlighting its philosophical, historical, and cultural underpinnings.

Feng Shui is an ancient Chinese architectural practice that originated during the Qin Dynasty, 221–207 BCE (Mak & Ng, 2004). However, its origins appeared in the Zhou Dynasty (1046–256 BCE), in which it was used only for geomancy, divination, and site selection based on natural landforms. Feng Shui, although not fully developed at the time, emphasized balance and harmony, Yin and Yang, and the flow of energy (*qì*, 氣) as the primary subjects of analysis during the Zhou Dynasty (Xie, 2014).

Balanced and harmonious Feng Shui architecture is a design space that creates positive energy, benefiting well-being and prosperity. It aligns with Yin and Yang elements and the flow of *qi* to create a space that supports health, well-being, prosperity, and happiness. The correct placement, orientation, and arrangement of these elements, along with the flow of *qi*, achieve balance and harmony. During the Qin Dynasty, unified government structures under Emperor Qin Shi Huang (秦始皇, 259–210 BCE) placed strong emphasis on order and harmony across the empire, which included integrating philosophical systems that aligned natural and human elements. Feng Shui was the primary tool in designing buildings and their surroundings to enhance this balanced and harmonious environment. However, the Qin Dynasty only used Feng Shui architecture to showcase the emperor's extravagant lifestyles and demonstrate the kingdom's wealth and power. It also restricted most Feng Shui architectural design elements to the royal family and their palaces (Baratta & Magil, 2021).

Residential architecture began incorporating Feng Shui design during the Han Dynasty (206 BCE–220 CE). Chinese people began to recognize Feng Shui architecture as a means of creating healthier, more prosperous living spaces, including courtyard houses (*sìhéyuàn*, 四合院). Feng Shui's design analysis thus profoundly impacted popular culture by influencing daily life within the built environment (Han, 2023). During this period, Confucianism and Daoism also began to influence Feng Shui design practices. Both philosophies had the

same goal with respect to Feng Shui architecture (a balanced and harmonious environment) but applied different approaches to its implementation. These divergent approaches, which influenced and spread throughout Feng Shui architecture practices, led to the formation of two primary schools during the early Han Dynasty: the Form School and the Compass School.

During the Zhou Dynasty, Feng Shui had featured balance, harmony, Yin and Yang, and the flow of *qi* as core elements of its divination practices. In the Qin Dynasty, Feng Shui evolved from geomancy to incorporate material architectural practices that emphasized harmonious order. Confucianism, which emphasizes hierarchy, family values, and ethical principles in architectural design, now synthesized the Zhou and Qin Dynasty approaches. Meanwhile, the integration of Daoism further enhanced this synthesis by emphasizing harmony with nature, spirituality, and the balance of opposing forces in design.

This research article compares Daoist and Confucianist influences within the context of Feng Shui architecture, providing insights into how these philosophies have impacted design principles for traditional Chinese courtyard houses. In this study, we revisit the spatial forms of traditional houses in the Chaoshan region of Guangdong Province, shedding light on the architectural characteristics and sustainability aspects of these historical settlements. we will also conduct a comparative analysis of the Form and Compass Schools, offering a comprehensive overview of the different approaches and principles employed in their architectural design.

As will become evident below, despite the impressive body of prior literature on Feng Shui, there remains a need for a more detailed comparison of the influence of Daoism and Confucianism in the context of architectural design approaches, particularly within the Form School. As we will show, research on the relationship between these philosophies and their enduring influence on Feng Shui architecture has been lacking.

LITERATURE REVIEW

Early Form of Feng Shui

The early form of Feng Shui prevalent during the Zhou Dynasty was used only for determining the best locations for building burial sites and cities. During this period, Feng Shui utilized physical features to analyze the site and determine the optimal location for *qi* to flourish in the environment.

Qi, also sometimes called “wind” (*fēng*, 風), is the main focus of Feng Shui (Thongkamsamut & Buranakarn, 2007). The primary goal of Feng Shui is to acquire *qi*, which is believed to bring fortune, longevity, power, and wealth to individuals (Yu, 2023). The ideal physical form in Feng Shui is that of mountains as they represent the stability and protection of *qi*. Mountains also symbolize fathers who anchor a site, safeguarding future generations. *Shuǐ*, meanwhile, means water (水), which is also a major focus. In the ideal Feng Shui site, the river flows primarily from the north, which also contributes to the town’s *qi*.

In the early Han Dynasty, Feng Shui developed into two primary schools of thought and practice: the Form and Compass Schools. The Form School focuses on physical elements similar to early Feng Shui, evaluating optimal locations. The Compass School, influenced by the Zhou Dynasty text *I Ching*, or *Yì Jīng* (*Book of Changes*, 易经), is based on the harmony of natural elements (Fang, 2013; Peng-Yoke, 2005). This school analyzes the directional aspects of a given site in terms of the relationship between the Five Elements and Eight Trigrams. The Form and Compass Schools have influenced various approaches over the centuries, leading to the development of more systematic formulas for Feng Shui.

Yin, *Yang* and *Qi*

Yin and Yang refers to the concept of balancing darkness (*yīn*, 阴) and light (*yáng*, 阳) in a complementary, equal way to create a harmonious environment. The Yin and Yang plays a profound role in the *I Ching*. The *I Ching* is one of the most influential texts in Chinese history, blending philosophy, spirituality, and divination. It provides a method for understanding change and making decisions based on the principle of Yin and Yang. The *I Ching* has influenced Chinese philosophy, including Confucianism and Daoism. In Feng Shui architecture, Yin spaces are passive; they are often bedrooms or study areas that need soft or low lighting and darkness to foster a tranquil atmosphere. In contrast, Yang spaces are active and described as living rooms or gathering spaces that need sunlight to enhance activity and an energetic environment.

The flow of *qi* is facilitated through the natural lighting and ventilation. In ancient China, *qi* was believed to be a life force that moved through an environment. It also promoted health, harmony, and prosperity. The flow of *qi* also aligns with both Yin and Yang to provide appropriately for a passive or active environment. In Yin spaces like bedrooms, it is considered best to minimize the airflow. Yang spaces, in contrast, often need to maximize airflow.

Early Feng Shui used Yin, Yang and *qi* as part of its spatial analysis. When Feng Shui diverged into the Form and Compass Schools, the central role of these concepts continued. Although the two schools had the same goal of pursuing balance and a harmonious environment, however, they had different approaches to Yin, Yang, and *qi*.

Form School in Feng Shui Architecture

The early Form School focused solely on analyzing the geography of a physical site (Thongkamsamut & Buranakarn, 2007). Confucianism, a philosophical system that emphasizes a moral and ethical approach to society and politics, significantly influenced the Form School, just as it shaped society and its core values during the Han Dynasty (Zhu 2009; Zhang Yao, 2023). Confucianism also emphasizes the significance of the family, moral integrity, and respect toward elders. It often uses abstract concepts to analyze designs that benefit residents and employs the ethics of clan society to promote a harmonious and balanced environment. During the Han Dynasty, it fostered a social and respectful environment by incorporating consideration for different family members into the design of residential buildings. Feng Shui architecture thus began to emphasize symmetry and spatial arrangements that reflected social hierarchies.

The five core values of Confucianism are righteousness (*yì*, 义), propriety (*lǐ*, 礼), wisdom (*zhì*, 智), benevolence (*rén*, 仁), and integrity (*xìn*, 信). The practical and rich designs of Feng Shui architecture of the Han Dynasty reflected these five values (Koczkas, 2023). They also incorporated the above elements of light and dark, privacy and socialization, and natural ventilation to balance within the social order of these environments.

Daoism also had a considerable impact on the achievement of balance within Feng Shui architecture, but through different methods. Similar to early Confucianism, Daoism also promotes social order, ethical conduct, and the education of future generations. However, unlike Confucianist influences, which focused on the physical building design, Daoism employs the resident's birthday and horoscope to analyze the equilibrium between the residents and their environment.

Chaoshan's Courtyard Houses

During the early Han Dynasty, Feng Shui architecture adopted hierarchical order as one of its primary features. In this period, the courtyard

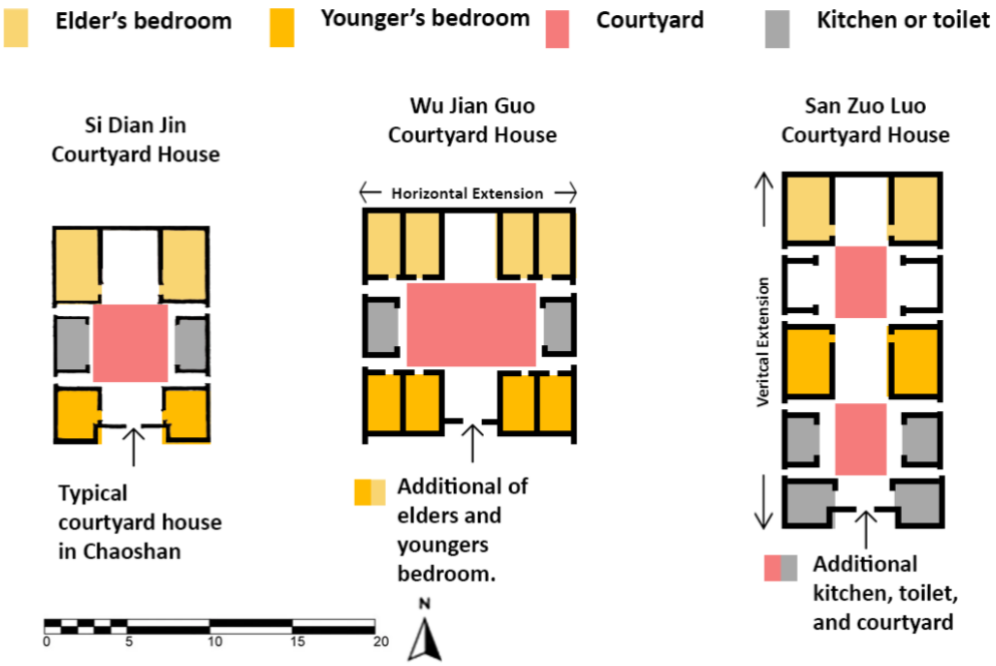
house became a residential building that was significantly influenced by Feng Shui. Courtyard houses date back to the Western Zhou Dynasty (1046–771 BCE). During the Han Dynasty, as Feng Shui gained widespread recognition in China, the design of these structures underwent further refinement (Huang et al., 2019). The Han Dynasty designs used hierarchy as the key to their orientation and organization. The courtyard houses of Chaoshan are exemplify designs that incorporated this principle to create a balanced, harmonious environment meant to foster respect and the socialization of the family (Zhao, 1989).

The Chaoshan courtyard house designs thus deeply integrated with social structures, embodying the principles of country and clan homogeneity. These designs often used a symmetrical layout to represent balance and harmony (Huang & Gu, 2020). The architecture and spatial arrangements not only fulfilled functional purposes but also served as a manifestation of social order and control, thus embodying Confucian values.

The *si dian jin* (“quadrangle courtyard”) is the typical courtyard house design in Chaoshan. Other courtyard house designs employ variations on this in their layouts (Figure 1). In the *wu jian guo* (“quinary-courtyard house”) design, the courtyard house is a horizontally elongated version of the typical *si dian jin* layout, providing more rooms for young and old family members. In contrast, the *san zuo luo* design is a vertically elongated version that adds a secondary living area and servants’ quarters. This layout prevents any negative *qi* from entering the main family rooms. The “four-horse trailer” design also maintains the *si dian jin* format but creates another set of rooms for the extended family. In this design, the center of the house is intended for the elder branch of the family, representing their power, wisdom, and knowledge (Figure 1) (Chao, 1989).

Figure 1

Courtyard House Designs in Chaoshan, China



Note. Analyses of houses' plans are added by the author. The houses' plans are redrawn by the author and adapted from Huang, X., & Gu, Y. Y. (2020). Revisiting the spatial form of traditional villages in Chaoshan, China. *Open House International,* 45(3), p. 6.

As stated above, Confucianist approaches to Feng Shui architecture utilize Yin and Yang as the primary principle for creating a harmonious and balanced environment. In addition to applying Confucianist principles, the table analysis of Yin and Yang in Feng Shui architecture aligns each room according to this belief system. The main entry and the living rooms embody Yang, which frequently requires *qi* to illuminate the space. They also feature excellent ventilation and natural lighting, fostering connections with other residents. Based on the principle of mutual support with negative energy, the kitchen and bathroom also embody Yang, acting as a means of mutually supporting the negative energy present in the space. The kitchen and bathroom also need natural ventilation to improve the air quality and create a healthy environment. Meanwhile, the bedroom embodies Yin, which refers to the dark relaxation of its environment. According to the cultural understanding within these designs, bedrooms need more controlled lighting and ventilation to provide peace and quiet during the night.

The Compass School in Feng Shui Architecture

In the late Han Dynasty, the Compass School became the primary approach to designing courtyard houses. Courtyard houses in Beijing, which will be discussed later, were significantly influenced by this school.

Daoism (sometimes spelled Taoism) is a philosophical and religious tradition that promotes living in harmony with the Dao (or Tao), which means “the Way.” Daoism seeks to describe the indescribable force that underlies and unifies the universe. Daoism encourages a balance between nature (that is, the universe), and humans to create and integrate a harmonious environment.

Compared to the Form School’s focus on landscape, the Compass School uses the Five Elements (*wǔxíng*, 五行) and the *bāguà* (eight trigrams, 八卦) in analyzing and planning for the auspiciousness of buildings. The Five Elements represent fundamental energies that interact with one another and influence the *qi* flow of a space (Figure 2). These elements are fire (*huǒ*, 火), earth (*tǔ*, 土), metal (*jīn*, 金), water (*shuǐ*, 水), and wood (*mù*, 木). These adhere to Yin and Yang, which the Compass School uses to avoid destruction and create balance and harmony. Meanwhile, the *bāguà* (Figure 2) is a tool that aligns each direction of the compass with its corresponding element. The *bāguà* contains eight trigrams (one for each cardinal and ordinal direction), and the trigrams also correspond to the Five Elements. The *bāguà* thus allows for the analysis of the functions of a building’s rooms (Zhang, 2021):

Wood (east and southeast): Wood symbolizes growth, creativity, and vitality. Wood element is associated with the east and southeast. It fosters health and unity among family members. It is suitable for a secondary entrance, which symbolizes new opportunities and connections for the family.

Fire (south): Fire is associated with the south, symbolizing activeness, warmth, and recognition. The south is therefore suitable for the main entrance hall or ceremonial areas. This placement supports the household’s reputation and social status, as fire enhances visibility and recognition. South-facing rooms also receive ample sunlight, which naturally energizes the space.

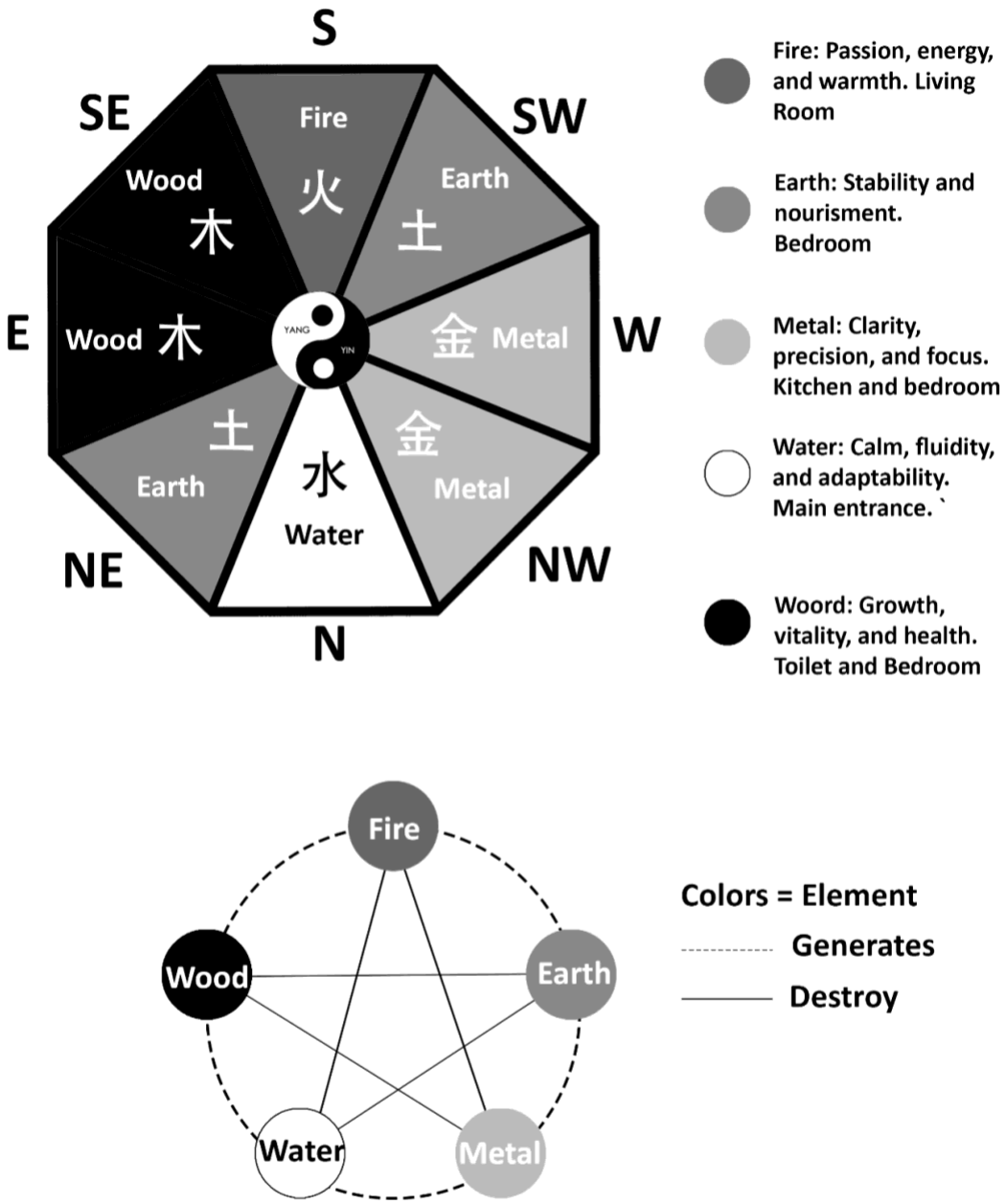
Earth (center, southwest, and northeast): Earth is central and stabilizing. It is represented by the central courtyard in a courtyard house, as its grounding effect promotes harmony and solidifies family bonds. Both the southwest and northeast also align with the earth element, but the northeast symbolizes knowledge, which makes it suitable for elders’ rooms. The southwest symbolizes support and nurturing and is thus the best location for guest rooms or the kitchen.

Metal (west and northwest): Metal represents clarity, organization, and support. It is associated with in the west, which is appropriate for studies or children's rooms, where focus, clarity, and discipline are important. It is also aligned with the northwest, where it represents guidance and leadership, and is thus often reserved for the head of the household.

Water (north): Water symbolizes calm, wealth, and intuition. It is associated with the north, which makes it suitable for a living room that fosters a prosperous family.

Figure 2

The Bāguà, Including the Five Elements and the Yin and Yang



Beijing's Courtyard Houses

During the Ming Dynasty, Beijing developed highly organized courtyard houses. The Compass School approach was much more focused on providing an individual environment for family members (Zhang, 2015). The design of Beijing's courtyard house provided multiple courtyards for one family, protecting each member's *qi* and reflecting distinct functions and purposes for the house. The main courtyard was usually central to the house and the heart of the home, where the family gathered for social interaction. The design also optimizes Yang (light and air), with the secondary courtyard serving as a garden or as a place for household chores. Often used for personal or family-related activities, the optional rear courtyard house emphasizes Yin (quiet, restful), serving as a retreat from the more active areas of the home. A rear courtyard was primarily adopted by higher-income families.

The layout, orientation, and organization of the courtyard houses in Beijing also drew on the Form School, utilizing the physical site and its natural surroundings to channel *qi* into the house (Figure 3). Confucianist principles emphasized hierarchy by positioning the elders' room at the rear of the house. However, the layout was also heavily determined by the Compass School. For example, the main entrance faced the south, which is considered the most auspicious direction and also allows the house to receive Yang (sunlight and wind) considering Beijing's climate. Meanwhile, the most important family members resided in the north side of the house, aligning with Confucian hierarchy and providing protection. The main courtyard took a central position, allowing for the gathering of *qi* and Yang to encourage positive *qi* movement.

In terms of room arrangement, the main room (*zhèngfáng*, 正房) on the north side is associated with Yin from the sides of the room and allows Yang to flow to the middle of the room, and it functions as a living room for the older family members. The rooms on the east and west sides are less critical and function as rooms for younger family members. The east and west rooms also balance the energies from the south (Yang) and north (Yin) of the building. Compass School designs also provided individuals with personal sitting and bedrooms, bringing Yang to the sitting room and Yin to the quiet bedroom. Depending on the family's income level, the southern part of the building could serve as a reception area for guests, servants' quarters, or storage. It also functioned as a kitchen or toilet. Wealthier families in Beijing also had secondary entrances, often located on the southeastern side, though they could be in other directions depending on wider Feng Shui considerations. A secondary entrance smoothed the flow of *qi* while also maintaining privacy and security.

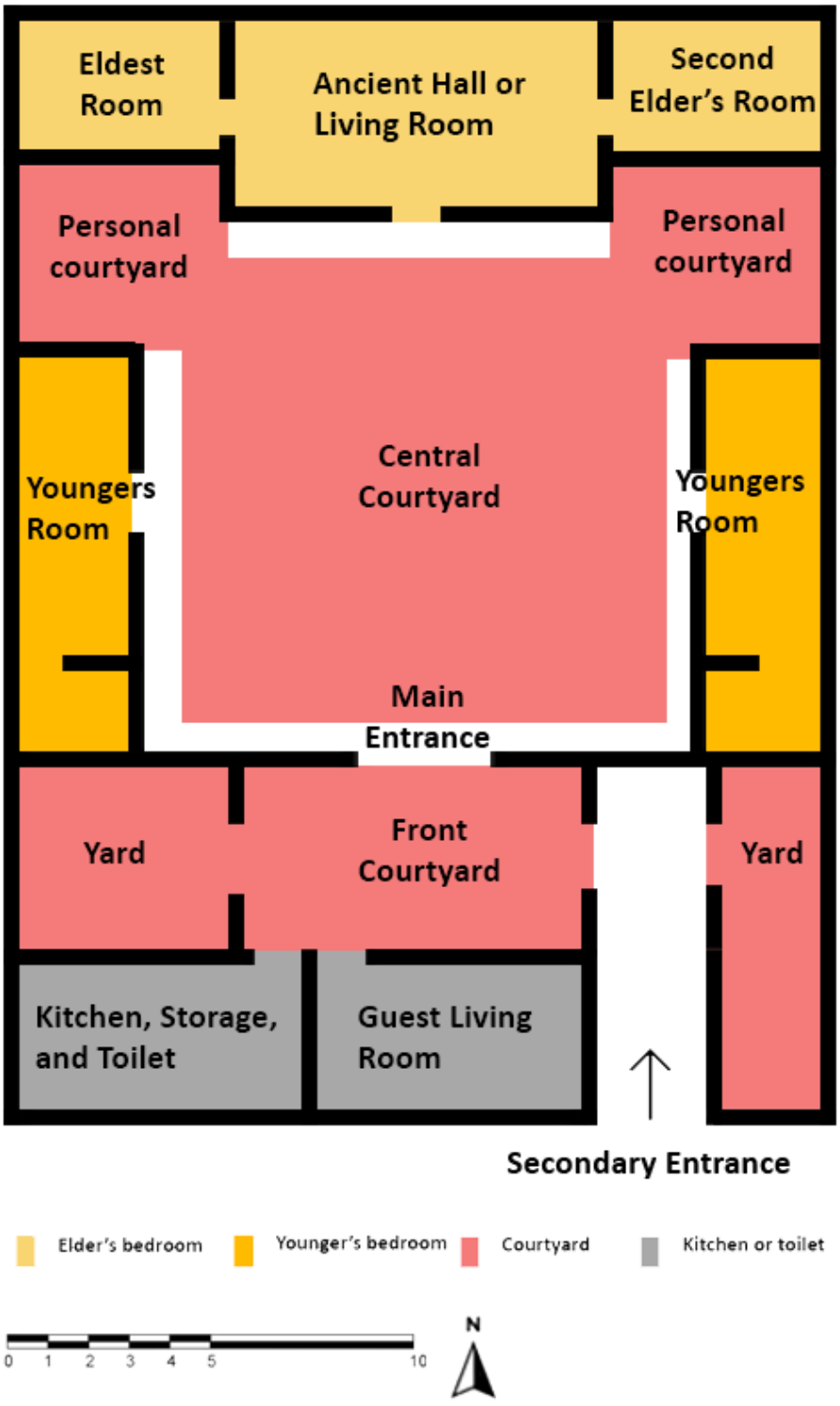
RESEARCH METHODOLOGY

Comparative and Spatial Network Analysis

This study employs a comparative analysis of the Form and Compass Schools in Feng Shui architecture. It examines the principles, design elements, and historical evolution of both schools to understand their impact on architectural design. We provide a comprehensive background on the evolution of these schools and their influence on traditional Chinese architecture, specifically in terms of the design of traditional courtyard houses. This includes an analysis of the layouts of courtyard houses in Chaoshan and Beijing, which will illustrate the practical application of each school's Feng Shui approaches in architectural design.

Figure 3

A Typical Layout Plan for a Beijing Courtyard House



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In our analysis of these layouts, we utilize DepthmapX (DepthmapX development team, 2017) to create a spatial network analysis. DepthmapX is a program that generates quantitative data on visibility, accessibility, and connectivity within a spatial layout, which are crucial for understanding the functional and social implications of architectural designs. This tool illuminates the social interactions and spatial dynamics assumed within the architectural designs. Using this program, we analyze how cultural values and social hierarchies, including from Confucianist and Daoist influences, are reflected in the spatial organization and design elements of traditional Chinese courtyard houses. we will also investigate how traditional architectural designs were adapted to handle different climatic conditions, including the analysis of design elements—such as building orientation—that addressed environmental challenges.

Our methodology therefore combines a qualitative analysis of historical and cultural contexts with quantitative data from spatial analysis tools. This mixed-methods approach will provide a comprehensive understanding of the impact of Feng Shui principles on traditional Chinese residential architecture.

Case Study Selection and Data Sources

This study uses two traditional courtyard houses in Chaoshan and Beijing as case studies. These were chosen for their historical and cultural significance and their application of Feng Shui principles to traditional Chinese architecture, which makes them ideal for a comparative study. The houses represent distinct architectural styles influenced by the Form and Compass Schools, allowing for a detailed comparison of how each school's principles were manifested in real-world designs. The houses also reflect the integration of Confucian and Daoist philosophies, providing a rich context for examining the cultural and philosophical underpinnings of Feng Shui architecture.

The data sources used in the study include historical texts and records, architectural plans and layouts, previous research and case studies on traditional Chinese courtyard houses, and spatial analysis software. This broad variety of sources provides a foundational context for the analysis and provides additional insights and comparative data. The quantitative data on the spatial dynamics of the houses was generated using DepthmapX; these data support the qualitative analysis by providing metrics on visibility, accessibility, and connectivity within the designs.

DISCUSSION

Development and Analysis of Feng Shui Architecture

Feng Shui can include both natural and architectural analysis, and both types of analysis have developed more systematic methods over the years. However, people now often associate Feng Shui most with the Compass School. As the design of residential buildings developed beyond courtyard houses in the Republic period (1912–1949), the Compass School began to involve *bāzì* (eight words, 八字) for design analysis. The *bāzì* uses a person's birthdate and horoscope to personalize the design and arrangement of their space based on their unique elemental profile. It reveals the balance of the Five Elements (wood, fire, earth, metal, and water) within their energy makeup. In Feng Shui, an individual's *bāzì* helps them select and create environments that harmonize with their needs, enhancing their well-being, prosperity, and overall life balance. Starting in 1912, as *bāzì* became involved in the Compass School's *bāguà* use in design analysis, the elements began to be interpreted based on a resident's *bāzì*. For example, if a resident's birth date is January 21, 2002, their *bāzì* will include the strong presence of metal and fire. When analyzing this kind of *bāzì*, the auspicious and

inauspicious aspects of the *bāguà* will change accordingly.

Auspicious Directions:

- South (fire): Fire supports metal, which can significantly enhance fame, recognition, and personal growth.
- West and northwest (metal) align with the same element, enhancing clarity, creativity, creativity, and helpful connections.
- Northeast and southwest (earth): This direction also strengthens metal due to its connection to earth, supporting knowledge.

Inauspicious Directions:

- East and southeast (wood): Wood depletes the metal elements, so avoid overemphasizing these directions.
- North (water): Water enhances wood and thus disturbs the balance of a *bāzì* of metal and fire.

Meanwhile, during this period, the Form School employed formulas to achieve balance and harmony by applying Confucian philosophy. However, the Form School continued to focus on conducting a precise analysis of the natural environment (especially mountains and rivers). This was in stark contrast to the Compass School's more formal and systematic approach of using *bāzì* and *bāguà*. As a result, the Compass School became more popular in modern times, especially in urban environments where landforms are less visible or prominent. Its reliance on a compass (the *bāguà*) and its perceived "scientific" methods gave it a more structured reputation than the Form School, making it more widely recognized.

A Comparison of the Form and Compass Schools

By comparing the Form and Compass Schools, we can better understand the specific design principles and techniques employed by each. The Form School focuses on the physical environment and natural elements, whereas the Compass School uses more systematic and abstract methods to achieve balance and harmony. Researchers tend to be skeptical that Feng Shui architectural analysis, formulas, and systems can enhance design, instead perceiving Feng Shui as merely offering a psychological impact on a building's residents. The Compass School has recently achieved a greater reputation than the Form School, especially owing to its incorporation of abstract notions, the Five Elements, and the *bāguà* in its architectural analysis and design.

People have been misled into believing that Feng Shui architecture also utilizes the physical site, natural surroundings, hierarchy, and social order in its architectural design. To demonstrate the benefits of Feng Shui architecture, this paper compares the Form School and the Compass School to determine the more beneficial design. The comparison focuses on the organization, flexibility, safety, and orientation of the traditional Chaoshan and Beijing courtyard houses. However, this comparative analysis does not involve discussions about *bāzì*; instead, it focuses on architectural, historical, and cultural perspectives, offering insights into how these houses reflected and served communal and environmental needs.

Organization

Early Feng Shui architecture followed the arrangement of the rooms according to the Form School. It used the physical location's features to design buildings, such as using surrounding mountains to protect it from cold climates during the winter, and creating openings at the south side to bring in warm wind (Thongkamsamut,

2018). Following these criteria, the design slowly evolved into a courtyard. This courtyard mirrors the location's characteristics by forming a wall around the house, with the south side serving as the entrance and allowing Yang and *qi* to enter the structure. Both the Chaoshan and Beijing courtyard houses were also influenced by Confucianism philosophy, with the rooms arranged in accordance with the family hierarchy. Both houses were built to create a balanced and harmonious environment within. However, they differ in that the Chaoshan courtyard house creates a unified balanced environment, whereas the Beijing courtyard house design used the *bāguà* and Five Elements to plan multiple layers of balanced environments within each room. The Beijing house thus balances Yin and Yang in each room, and the central courtyard balances the whole house. In the Compass School, the side of the courtyard house also explains why the room arrangement could benefit each family member. The organization of the Chaoshan and Beijing courtyard houses thus reflects how the Form and Compass Schools created harmonious environments within buildings while also regulating social and visual interactions as necessary.

We used the DepthmapX software (DepthmapX development team, 2017) to visualize how Yin and Yang influenced the layouts of private and social spaces in both houses. For other examples of spatial network analysis at different scales, see Awal (2022), Prasertsuk and Busayarat (2022), and Shu and Lin (2020). In the Chaoshan courtyard house, the entryway, central courtyard, and living room (Yang spaces) constituted the public spaces that enabled the most visual social interaction (Figure 4). Meanwhile, software analysis revealed that the bedroom (a Yin space) involved less visual and social interaction than the other bedrooms. Conversely, the Beijing courtyard house fosters continuous social interaction within each room (Figure 5). However, because the Beijing house features more layers of balance and a harmonious environment in Yin and Yang, it allows for significantly less social interaction than is necessary for bedrooms (Figure 6).

The Beijing house's central courtyard, designed to optimize the Yang energy flow, serves as the heart of the home, promoting social interaction and family cohesion, and serves as the home's central feature.

Flexibility

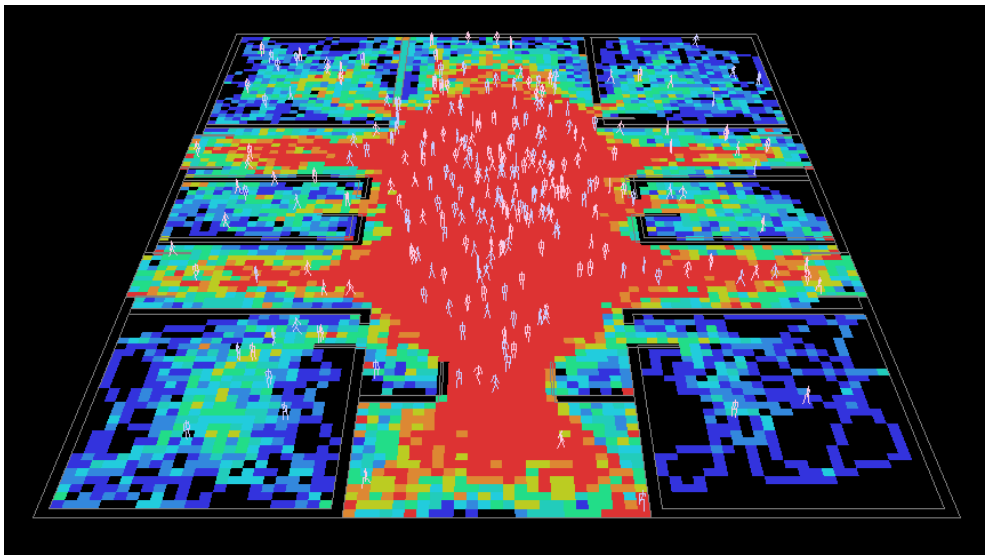
The flexibility of a house facilitates multiple family activities; it improves the functionality of the house and enables residents to design the environment as per their needs. The Chaoshan house's layout and design adhered to the Form School's principles in its symmetrical design and hierarchy. It implements a layout and design that were common during the early Han Dynasty and reflect China's historical focus on respecting the family and elders (*zūn lǎo ài yòu*, 尊老爱幼). While the various types of courtyard houses were determined by the income levels and the number of family members, the basic design remained consistent. The Chaoshan courtyard house, in its pursuit of balance and harmony, illustrates that altering any room within the house could disrupt the balance of Yin and Yang.

Meanwhile, the Beijing courtyard house was more influenced by the Compass School, and its design decisions were made based on the *I Ching* and *bāguà*, which developed a more adjustable approach. The Beijing house features multiple layers of balance and harmony, extending from individual rooms to the central courtyard. This improves the functionality of the rooms, which can increase flexibility. This is especially important as Beijing has historically experienced a colder climate than Chaoshan. To combat the harsh winter weather and wind, the Beijing courtyard house incorporates a second wall and a secondary entrance on the north side to prevent Yin from entering the house. The open ceilings of the secondary wall and entrance allow Yang to create balance with the Yin from the north, thus diminishing negative *qi*.

The differences between the Beijing and Chaoshan courtyard houses are primarily a result of their respective geographic locations, climates, social structures, and cultural histories. While both houses share the core principles of Feng Shui and Confucianism, their layouts reflect the unique needs of the people who lived in them. The Beijing house is more formal, enclosed, and structured, focusing on protection from the cold and reinforcing the social hierarchy. However, it allows for greater flexibility in permitting the additional functions that each family member requires (Figure 7). In contrast, the Chaoshan house is more open, ventilated, and flexible, adapting to Guangdong's warmer climate and multi-generation households. However, the Form School design principles make it difficult to change the layout as required.

Figure 4

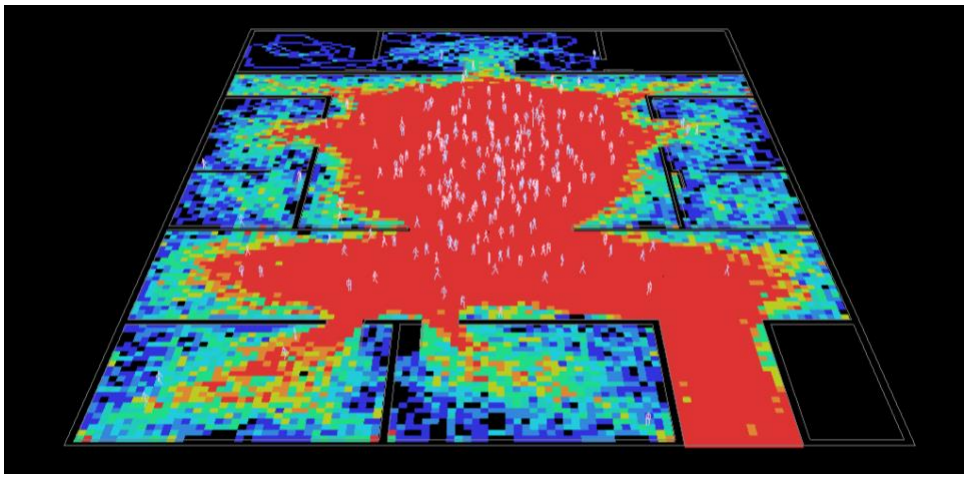
Spatial Analysis of the Social Interaction Space in the Chaoshan Courtyard House



Note. The spatial analysis of the Chaoshan courtyard house was generated using DepthmapX.

Figure 5

Spatial Analysis of Social Interaction Space in the Beijing Courtyard House



Note. The spatial analysis of the Beijing courtyard house was generated using DepthmapX.

Figure 6

Yin and Yang in the Chaoshan and Beijing Courtyard Houses

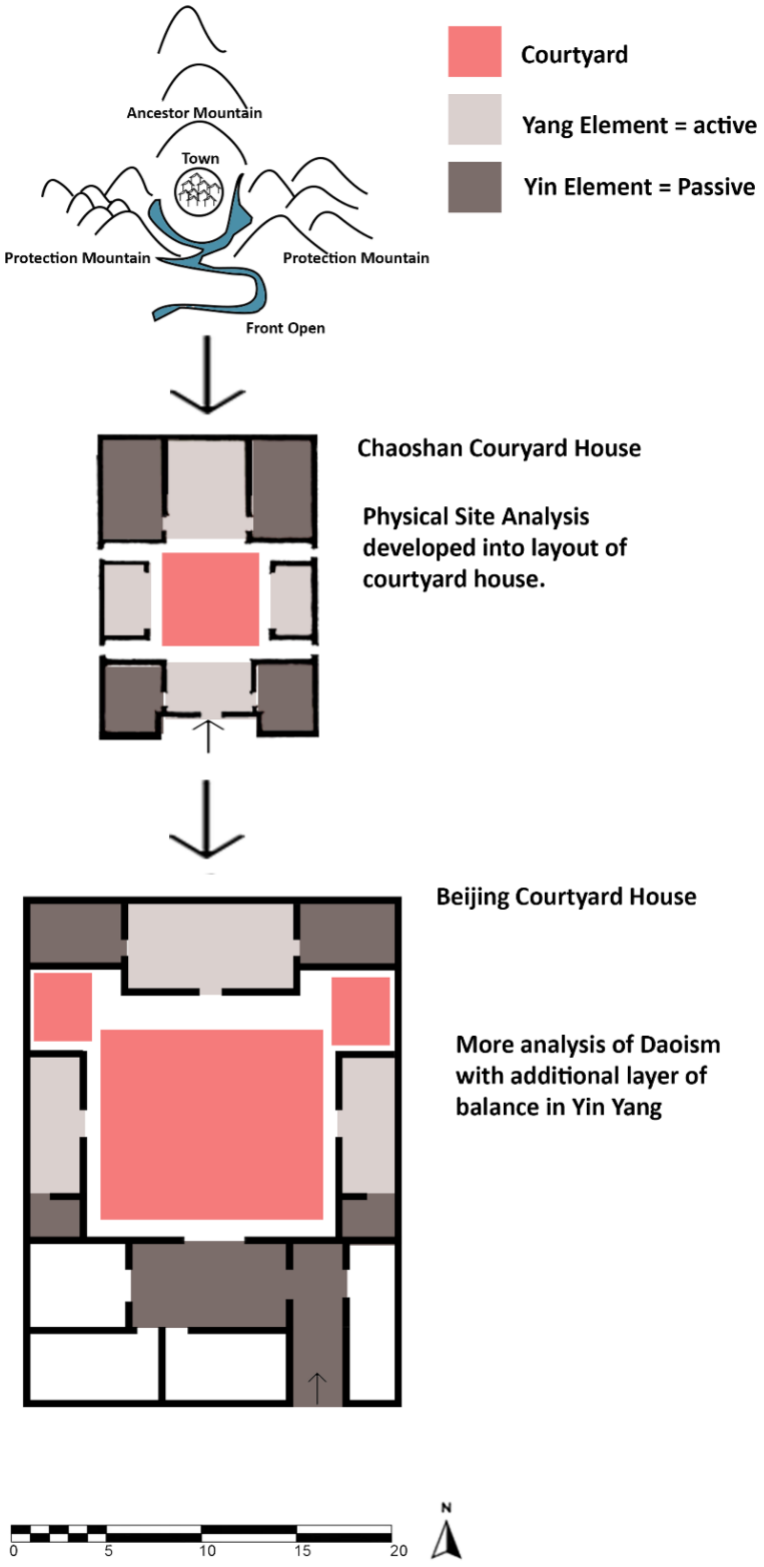
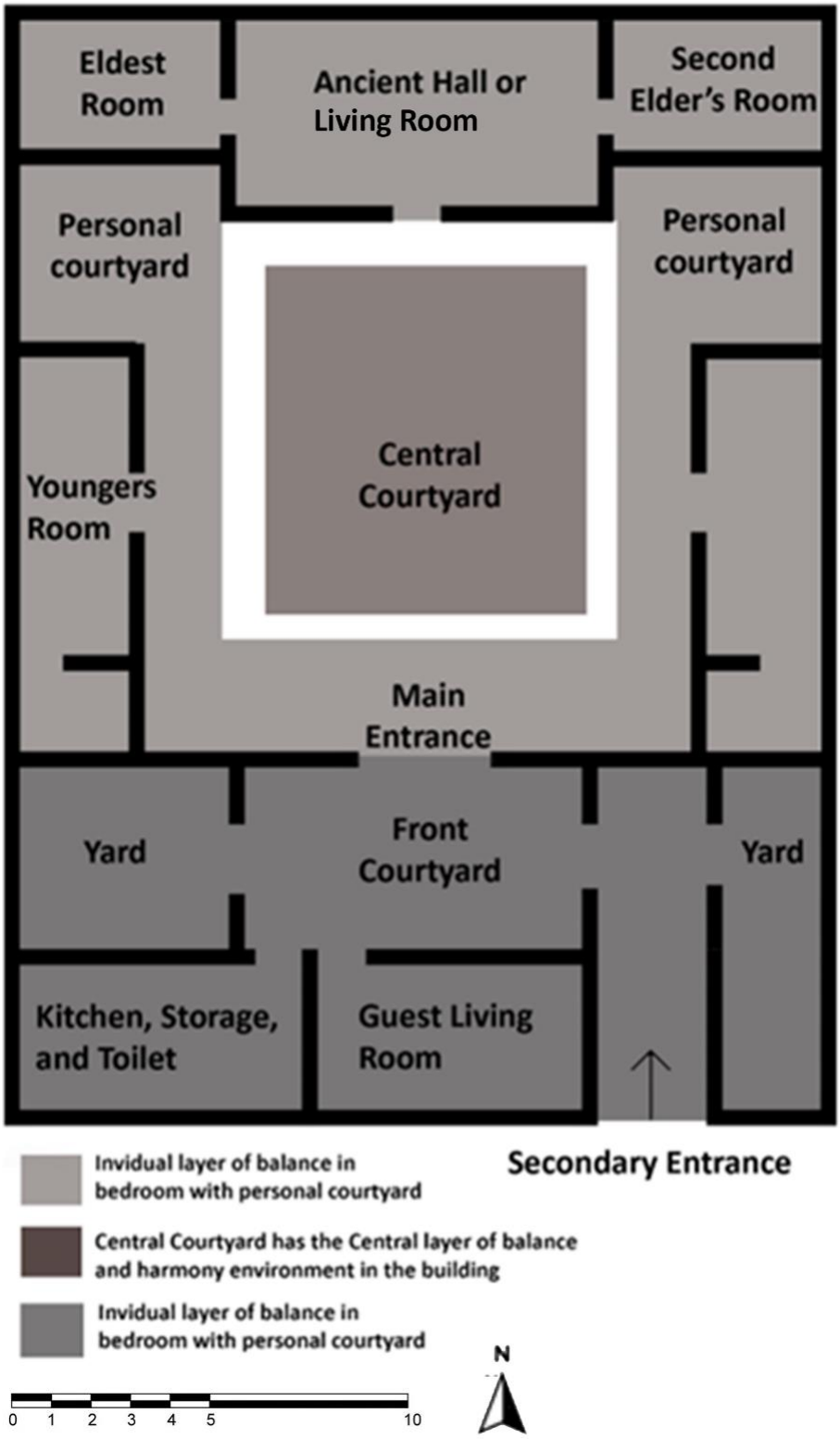


Figure 7

Spatial Analysis of Yin and Yang in the Beijing Courtyard House



The Compass School uses *bāzì*, or birthdates and horoscopes, to personalize space design, enhancing residents' well-being and prosperity. This flexible approach can be adapted to modern architectural needs, making it relevant in urban environments with less prominent landforms. Th The Compass School's principles thus gained widespread recognition and application due to their adaptability to modern architectural needs.

Safety

The design decisions of the Chaoshan and Beijing courtyard houses were also concerned with the possibility of the attack or invasion. However, both schools had different methods of ensuring a family's safety. The Chaoshan house features a high wall (four to five meters) to defend against invasion. The term for the layout, *si dian jin*, also refer to methods of defense. The term refers to four "golds" (that is, rooms), one at each corner of the house. The front corners' "gold" (rooms) were intended to protect the older family members should the front gates be penetrated.

In the Beijing courtyard house, which was designed according to the Compass School of Feng Shui during the Ming Dynasty, safety from invasion was enhanced through its strategic layout. Like the Chaoshan house, it employs high walls on all sides and an entrance at the south. In addition, it added a second wall and entrance to help with any invasion from the outside. To protect the family, the younger members' rooms are not located in the front of the house; the design is more focused on using walls and layouts to protect them.

The courtyard houses were thus designed for safety and protection, with the main entrance oriented toward the south for Yang energy and the north side being reserved for family members. The use of the *bāguà* and the Five Elements ensured a balanced energy flow throughout the house while also maintaining a safe living environment on a practical level. This balance mitigates the negative influences and enhances the positive ones.

Orientation

The orientation of both courtyard houses is the same: they both face the south to receive *qi*, as is the standard design for such structures. Winters in China can be harsh, leading to an orientation that helps the structure collect more warm air and natural lighting to fight the cold flowing from the north. Beijing tends to have more extreme winters, which influenced the Compass School designs. The Beijing house design thus includes a secondary wall and entrance. The secondary entrance helps mitigate issues caused by negative Yin during winter and brings more natural lighting into the house. Before the incorporation of *bāzì*, Beijing courtyard houses also relied on the south and southeast for natural lighting and ventilation. The Compass School emphasizes the importance of orientation, with south-facing entrances being the most auspicious. This orientation allows for ample sunlight and wind, symbolizing prosperity and good fortune. Each direction in the Compass School is associated with specific elements and their corresponding qualities, such as the north representing calm and wealth and the south enhancing visibility and recognition. This directional symbolism guides the placement of rooms and functions within a house.

RESULTS

By comparing the physical and metaphysical approaches of the Form and Compass Schools, this study highlights the different complexities and benefits of each school of architectural design. The Form School emphasizes the physical integration of buildings with natural elements such as mountains and water bodies. This approach ensures stability and protection of *qi*, creating a harmonious environment that is well-integrated with its natural surroundings. The Compass School employs a more systematic and structured approach, using tools such as the *bāguà* and the Five Elements to determine the appropriate orientation and placement of structures. This method relies on complex formulas and a compass to align buildings with favorable directions; thus, this method is perceived as being more structured and scientific. The Form School's design process is

relatively straightforward, focusing on the natural landscape and the physical site to create a balanced environment. It involves less complexity compared with the Compass School, which uses detailed analysis and personalized elements such as *bāzì* to optimize the energy flow in a space. Both schools are also deeply rooted in the cultural and philosophical traditions of Confucianism and Daoism. However, the Form School is more aligned with the physical aspects of these philosophies, whereas the Compass School incorporates metaphysical elements, maintaining its adaptability to individual needs and modern urban environments. The Form School provides psychological benefits by creating a visually balanced and harmonious environment, whereas the Compass School aims to enhance well-being, prosperity, and happiness by aligning the flow of energy with residents' elemental profiles.

CONCLUSION

The Form School impacted early courtyard house design by focusing on site selection, natural integration, and spatial organization, resulting in a balanced and harmonious setting. The Compass School enhanced the design details by incorporating personalized room configurations, adaptability, and methodical development, thus ensuring well-being and contemporary relevance. Understanding the particular merits of each school at various stages of the design process allowed architects to produce more harmonic and balanced architectural designs.

This study has covered the evolution of courtyard houses only up to the Republic period, which may limit its applicability to contemporary architectural practices and modern urban environments. It was also limited to courtyard houses from the Chaoshan and Beijing regions, which may not fully represent the diversity of Feng Shui as it was historically applied in various structures across China. Technological limitations include the limitations of tools such as DepthmapX for spatial analysis, which may not provide detailed insights into the spatial dynamics of Feng Shui architecture. Lastly, the study is deeply rooted in Chinese cultural and philosophical contexts; thus, its findings may not be easily transferable to other cultural settings.

Nevertheless, this study has offered insights into the philosophical foundations and practical applications of Feng Shui in architectural design, its historical context, cultural and social impacts, and climate adaptation strategies. It has also illustrated the potential uses of spatial analysis tools like DepthmapX for architectural analysis. The study highlights the divergence in design styles in the north and south, demonstrating that the practices of different schools resulted in unique approaches to a shared philosophy of architecture.

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