

Inheritance and Development of Chinese *Kang* in Interior Space

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Abstract

The Chinese kang is an ancient technology that combines an integrated household system for cooking, sleeping, and heating. Most of the existing research focuses on the energy performance of Chinese kang and its impact on the interior environment and tries to adapt it to the modern interior space through the improvement of its technology. However, if we only focus on the research and improvement of the technical level of Chinese kang, it is not conducive to the effective inheritance and development of the culture. This paper studies the concept of 'inheritance and development' of Chinese kang culture more comprehensively from the perspective of interior design. The study proves that Chinese kang is not only a survival necessity to cope with cold, but also an expression of people's emotional catharsis and psychological needs, and that the intangible values of Chinese kang culture can be integrated into tangible modern living spaces and developed in the process of modernisation. The results of the study can be used as a starting point for enriching the Chinese kang culture and interior living culture from different perspectives in the future.

Keywords: Chinese kang, cultural heritage, inheritance and development, kang culture

Introduction

As a part of the interior space, the layout of the Chinese *kang* is usually based on the spatial layout of architectural forms. However, due to the development of the times, some regional buildings have been damaged, and the interior space is even worse, resulting in fewer Chinese *kang* surviving in their original form. Fortunately, in recent years, more and more attention has been paid to preserving and restoring buildings. Many researchers have explored from different perspectives to regenerate the original form of the Chinese *kang* in the architectural structure and interior space. In addition to technical restoration, many researchers and scholars have begun to pay attention to the cultural phenomenon behind the physical form and the inheritance and development of traditional culture in the modernisation process.

Chuan cheng fa zhan (传承发展) is a Chinese term that can be translated into inheritance and development in English. This concept is often used in the context of cultural, technological, or intellectual heritage. It emphasises the idea of passing down traditions, knowledge, and achievements from one generation to the next while simultaneously promoting progress and development. The heritage and development of the Chinese *kang*, in terms of technology, means building on existing ideas, innovations or scientific advances to promote further research, improvement and innovation. In terms of culture, there is a need to balance preserving the roots of culture and allowing it to thrive in a changing world.

The Concept and Origin of Chinese *Kang*

The Chinese *kang* is a traditional interior element commonly found in rural houses in northern China. It is made of bricks or adobe, with a mat on top and an aperture underneath to connect with chimneys and stoves, and it functions as a bed that can be warmed by a fire (Figure 1). From the northeast of China to the northwest and the vast area of north China, Chinese *kang* can be found in the countryside and some residential houses around towns and cities, and they can be called the specialties of the north (Wu, 2017). A typical Chinese *kang* consists of a stove, a *kang* similar to a bed, and a chimney. It allows at least four different household functions, cooking, bed, domestic heating, and ventilation, to be integrated into one system (A. Li et al., 2016). Due to the cold and dry climate for most of the winter in northern China, the average temperature is below -10 °C. The Chinese *kang* is an effective way to provide heat to the population, and it is mainly distributed in 14 provinces, where nearly 85% of households use it (Zhuang, Li, Chen, & Guo, 2009). According to the Ministry of Agriculture, in 2004, 43.64 million rural families used 66.85 million

Chinese *kangs*. This means that with a population of 174.56 million if there are four people in a family, the average family in northern China has at least 1.5 Chinese *kang* (Y. Li et al., 2006).



Figure 1
Chinese *kang* as an
integrated system
in the household
(Photograph by
authors)

Historians and archaeologists have focused on the origins of the Chinese *kang* and the conditions under which it arose, examining the remains of the Chinese *kang* in different regions in stages, studying the form of the *kang* briefly, and some authors have been able to relate it to human behaviour or culture. Zhou (2008) discusses the historical origins of Chinese *kang* in terms of the origin of the word *kang* and the reasons why the ancients 'dug pits to make fire.' They found that the reason for 'digging a pit to make a fire' is related to the natural and living conditions, the way people kept out the cold and the habit of barbecuing food, which led to cooking on the ground and sleeping around it, like the way people slept on a bed to keep warm and cooked on a stove. Guo (2002) explores the origins and history of Chinese *kang* and traces the development of the form and its applications in archaeological terms. It can be inferred that changes in social customs, materials, and technology are evident in the facility of the Chinese *kang*, which largely reflects the experience and wisdom of people's lives.

The investigation of *kang* in this paper is limited due to the lack of mention of the Chinese *kang* in the open scientific literature. The authors conducted the investigation based on field research, and the relevance of the literature searched in the database with 'kang' as the keyword to this study needs further screening, which favours literature

related to *kang* and human beings, indoor space, and regional culture. Besides, most of the literature covered in this paper comes from China and local books or manuscripts not publicly published by the author. In the literature collected so far, the geographical scope includes not only China but also Korea, Rome, the United States, and Germany.

This paper attempts to utilise and evaluate this literature, firstly, to sort out the functional principles and developmental evolution of Chinese *kang* in the temporal dimension and to provide an overview of the technical aspects of Chinese *kang* that have been able to be effectively utilised in modern interior spaces. Secondly, a literature review of the diversity of Chinese *kang* features in the spatial dimension is presented, covering the geographical differences between *kang* in northern China and *kang* abroad, where *kang* defines and relates to the living conditions within a specific geographical area. Finally, while the causes of some existing Chinese *kang* can no longer be explained and studied from a known functional perspective, it is necessary to delve further into the cultural phenomenon of the Chinese *kang* as it exists in interior space to explain it, such as finding correlations from the perspectives of folklore, anthropology, and environmental behaviour. The authors' literature review, which focuses on Chinese *kang* culture from different perspectives, will serve as a reference for future research on the inheritance and development of Chinese *kang* culture and how to preserve Chinese indoor living culture.

Principles and Development of Chinese Kang

The Chinese *kang* is a simple heating system, and most of the research and literature collected has explored the heating principles and development of the Chinese *kang*. This section attempts to discuss the continued use of the Chinese *kang* in modern interior spaces.

Principles of Chinese kang

The basic principles of a Chinese *kang* include thermal storage, radiant heating, and localised heating (Zhuang, Li, & Chen, 2009). Underneath a brick or adobe bed, there is a series of pipes that carry the heat from the stove, and the whole system is called a *kang* (Figure 2) (S. Yan et al., 2022). When cooking, the heat generated by the stove heats the *kang*, making it the centrepiece of the northern dwelling. There are various forms of *kang*; those in which the flue passes through a wall are called *kang-qiang* (炕墙), and those in which the flue passes below the ground are called *di-kang* (地炕). Regardless of the form, the overall principle is the same (Williams, 2014). The Chinese *kang* is a meeting point, the centre of family, and even community life. It is a place where guests are welcomed, groups of women work, and families survive the cold together.

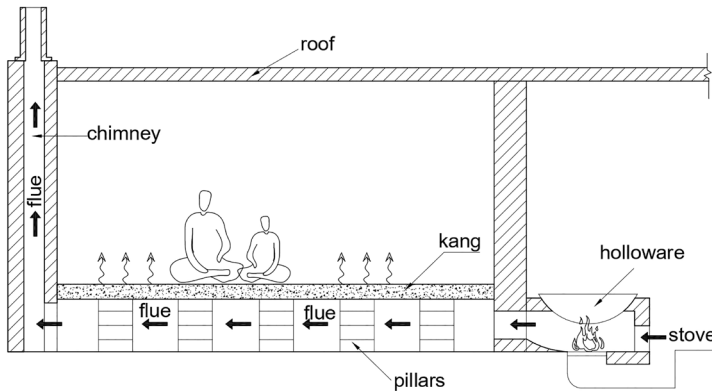


Figure 2
The principle of the Chinese *kang* (Image by authors, adapted from S. Yan et al. (2022))

The fuels commonly used for Chinese *kang* include straw and wood. Currently, rural building heating accounts for 25% of China's total building energy consumption (Zhuang, Li, & Chen, 2009). According to Zhuang, Li, and Chen (2009), *kang* can reduce the heat load of a building by 50%–80% when heating a home. Rice straw and stalks are abundant in rural China, and these fuels can be utilised in stoves to reduce waste and pollution (A. Li et al., 2016). Using the Chinese *kang* effectively reduces the economic cost of fuel and has a low technological threshold, which meets the living needs of rural residents (S. Yan et al., 2022). A. Li et al. (2016), Duanmu et al. (2017), Guo (2002), Williams (2014), Zhuang, Li, and Chen (2009), and other researchers discussed the Chinese *kang*'s physical attributes in terms of its working principle, structure, and material factors, and successfully drew from it the evaluation and modelling of the Chinese *kang* system to apply the new thermal energy to modern social life. Yu et al. (2020) summarise the system in terms of the three types of Chinese *kang*: the Han straight *kang*, the Manchu curved *kang*, and the Korean *kang*. Guo Jiye, Secretary General of the Liaoning Rural Energy Industry Association in China, was awarded the *Chief Chinese Kang Expert* title by the Chinese Ministry of Agriculture and is also popularly known as the 'king' of Chinese *kang*. His book, *The Kang Album* contains more than 60 ways to build a Chinese *kang*, documenting the many forms of Chinese *kang*, creating a method of building a Chinese *kang* suitable for modern society, and guiding other researchers to acquire Chinese *kang* technology. His contemporary, Korean professor Kim Jun-Bong, founded the International Kang Association and has been at the forefront of the international development of *kang* as its president.

Development of Chinese kang

S. Li et al. (2007) discuss the connotations, types of forms, and development of the Chinese *kang*, and claim that improvements and

applications of the Chinese *kang* are needed to inherit the foundation of good traditions and further improve the quality of life of rural people.

The *kang* has undergone various stages of development, from the earliest burnt floors to the latest elevated *kang* (Zhuang et al., 2010). The current Chinese *kang* is generally shaped by the experience and intuition of craftsmen. In the past decades, some residents have adjusted the layout of the Chinese *kang* according to the layout of their houses while retaining the Chinese *kang*'s functionality, trying to find a better relationship between the Chinese *kang* and their homes for a more comfortable living environment (S. Yan et al., 2022). At present, many alternative heating methods to the Chinese *kang* have appeared in the rural areas of northern China, such as coal-fired radiators, household heating stoves, coal-fired low-emission stoves, household biomass gasification stoves, and semi-gasification stoves. Combining the amount of heat energy used in rural areas in the north, the concept of sustainable utilisation, and the long history and culture of the Chinese *kang*, the improved Chinese *kang* has become the best alternative to sustainable and energy-efficient heating systems for rural households in northern China (Zhuang, Li, Chen, & Guo, 2009).

The previous studies mentioned earlier examine the history of the origin and changing forms of Chinese *kang* as well as advocate the effectiveness of the Chinese *kang* in the domestic space. Such knowledge is important for promoting traditional Chinese *kang* culture while maintaining the equality of life of the inhabitants.

Regional Differences of Kang: The Diverse Spatial Characteristics of Kang

Due to the natural climate, the existence of *kang* was limited to the colder regions of the north. Hence, the number of countries and regions covered in the study of *kang* is limited and the cultural differences between regions result in a wide range of forms and cultures behind the existence of *kang*. Even so, documentation from other regions can still provide some references regarding the Chinese *kang*. The following sections will discuss the presence of *kang* in Northern China and other countries where *kangs* are found.

Kang in Northern China

China is a vast country with 56 ethnic minorities, and the living and cultural environments are very different from one place to another, resulting in a wide variety of Chinese *kang* types. The shape of Chinese *kang* varies from different regions and can be broadly categorised into kiln *kang*, half-room *kang*, whole *kang*, long *kang*, *kang* against

a hill, opposite *kang*, *wanzi kang*, Korean *kang*, and *panlong kang*. Depending on the material, Chinese *kang* can be categorised into earthen *kang*, brick *kang*, stone *kang*, and so on (D. Li, 2010). The Chinese *kang* is usually rectangular, about 3 metres long, 1.8 metres wide, and 0.5 metres high, and is made of brick or other materials. The design of the Chinese *kang* varies greatly, influenced by different regions. Usually, the Chinese *kang* is connected to a flue, a stove, and a chimney. The stove heats the combustion even when not cooking, storing heat in the flue of the Chinese *kang* and releasing it throughout the bedroom to maintain the room temperature (Y. Li et al., 2006).

The main areas where Chinese *kang* can be found in China are the Northeast, Northwest, and North China (including Shanxi province). The cold winter conditions had a huge impact on the people's way of life, and the Chinese *kang*, as an effective way of heating the house, was influenced by different factors and developed different characteristics. *Heilongjiang Sheng Zhi* (2001) summarises how the Chinese *kang* took the form of a U-shaped *kang* and straight Chinese *kang* (Figure 3) due to the layout of the interior space, the influence of the climate, and its role in storage and defence. *Jilin Sheng Zhi* (1992) not only summarises the forms and functions of Chinese *kang* but also highlights the decorative features of Chinese *kang* in various places.

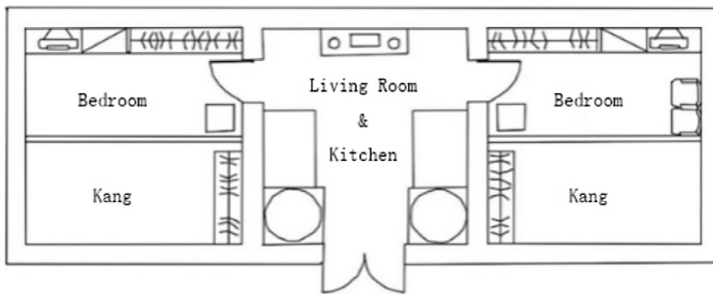


Figure 3
Straight Chinese *kang*
(Image by authors)



Figure 4
Korean *kang*
(Photograph by Korea Heating)

Neimenggu Sheng Zhi (2007) in Northwest China describes how the Chinese *kang* is presented in different minority groups. The Manchu *kang* is mainly set on the west side, and only a small part is set on the east, north and south side. At the same time, the Korean *kang* (Figure 4) is entirely laid out indoors, with the cooker 50–80 cm below the floor of the house and flat planks of wood when the cooker is not in use, giving it a neat appearance, with the cooker attached to the *kang* and the living area altogether.

The Chinese *kang* in Shanxi province, part of northern China, has different characteristics depending mainly on the geographical area and is influenced by natural conditions and architectural styles. Bai (1998) mentions that the Chinese *kang* of kiln dwellings in the western Shanxi region, which belongs to the high-loss terrain and is influenced by the difficulty of lighting and excavation, the *kang* in kiln dwellings is set on the south side of the interior space, and the material of the *kang* is loess. The traditional courtyards of the Shanxi merchants are analysed in the *Jinzhong Shi Zhi* (2010) as being more often brick and stone quadrangles with more elaborate interior layouts and the most decadent furnishings on the Chinese *kang*. In Changzhi City, in the south-eastern region of Shanxi, the Chinese *kang* was solid, without a flue, and heating required digging a flue from the wall and connecting it to the stove (Changzhi Shi Zhi, 1995).

The Chinese *kang* plays a very important role in traditional residential architecture, and its layout directly affects the indoor layout of the residential form. The Chinese *kang* layout in the traditional houses in Shanxi is divided into three kinds: the south-side *kang* (Figure 5), the north-side *kang* (Figure 6), and the centre *kang* (Figure 7). Therefore, *kang* may affect the indoor layout differently.

In recent years, some asymmetrical, overlapping, and integrated housing types have appeared in some houses in Shanxi, attracting people's attention. However, the original symmetrical layout of the north-side *kang*, the south-side *kang*, and the centre *kang* can no longer satisfy people's functional needs in life. The integrated type of residence combines the south *kang* type and middle *kang* type, the north *kang* type and middle *kang* type with each other, and then improves and innovates the space. It is designed according to the different groups of people living in the residence, and it is more humanised and rationalised. The comfort of people living in the residence is also greatly improved (Figure 8).

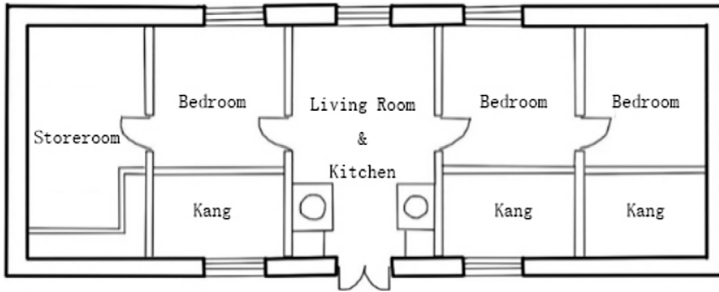


Figure 5
South-side kang
(Image by authors)

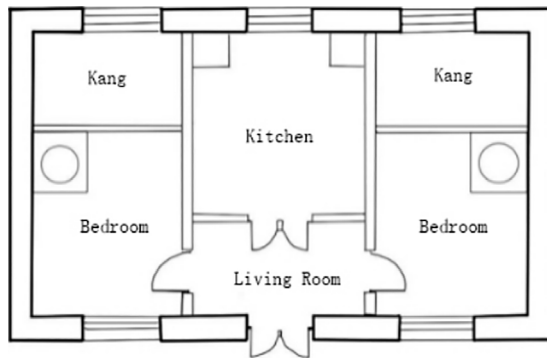


Figure 6
North-side kang
(Image by authors)

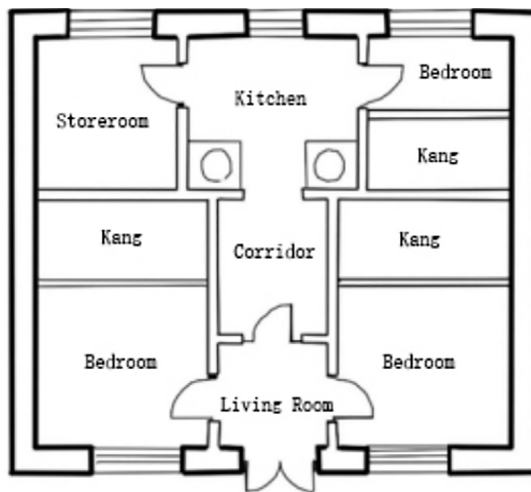


Figure 7
Centre kang (Image
by authors)

The Chinese *kang* in Shanxi is not only different in its form, but the decoration of the Chinese *kang* also has significant regional characteristics. The most famous is the wall painting around the Chinese *kang* (Figure 9) in Yuanping County, Xinzhou City, Shanxi Province. As a form of folk art for decorating interior walls, it combines the modelling techniques of *frescoes* which are painted by the artisan to create images on every New Year and important occasions such

as birth, wedding, and death. Not only that but architectural images were also used to paint the Chinese *kang* walls. These paintings depict a unique form of artistic expression, which contains the cultural significance of profound artistic value (Chen, 2014).

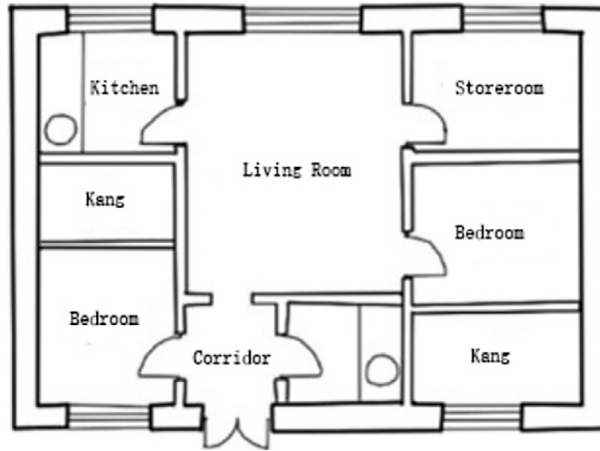


Figure 8
Comprehensive *kang*
(Image by authors)



Figure 9
Wall paintings around
the Chinese *kang* in
Yuanping County,
Shanxi Province
(Photograph by
authors)

In addition, Shanxi's furniture is known throughout the country, and therefore, the Chinese *kang* has a rich range of furniture types. Gustav Ecke (1896–1971), in collaboration with Yang Yao (1902–1978), wrote the first Chinese monograph on furniture in 1944, *Chinese Domestic Furniture in Photographs and Measured Drawings* (Ecke, 1986) included a small reference to the Chinese *kang* furniture of Shanxi province;

however, as a Western scholar, he was still slightly off on the details of traditional Chinese furniture. Hence, the types of Chinese *kang* furniture that he recorded were later corrected in Wang Shixiang's *Studies in Ming Furniture* (Wang, 2007).

Kang in other countries

In addition to China, there are many heating systems similar to *kang* in foreign countries, such as the *ondol* system (Yeo et al., 2003) in South Korea and hypocaust in Rome (Bansal & India, 1998). The Korean *ondol* system and the Roman hypocaust system are both systems that work on the same heating principle as a *kang*. It is also very similar to the Chinese Korean 'full bed' in that it is heated by hot smoke from a kitchen or stove outside the house flowing through the lower level of the room. Although some scholars have researched this in Korea, they have been rather sporadic (Kim et al., 2019).

The term *kang* is called *ondol* in Korea, and the word *ondol* first appeared in the Korean *Annals of the Yi Dynasty*. It is a Korean-made Chinese word that has been inherited in the West and almost the entire population lives on *ondol* (Jin, 2010). Therefore, Korean furniture, such as quilts, clothes, and three-tier cupboards, is placed on the *kang*. Jin (2010) mentioned that in Korea, regardless of the number of rooms, all the *kangs* are connected and are heated by one or two stoves. D. Kim (2004) worked extensively on the bid for the *ondol* technique in Korea. The Korean *ondol* system heats the space under the floor inside by sending hot smoke from the stove outside the kitchen (A. Li et al., 2016). Meanwhile, Yeo (2003) researched the historical development of *ondol* and its potential for energy efficiency in modern housing.

Some Europeans wrote in their accounts of *ondol*. When Dallet, a French Catholic missionary, compiled the history of the Catholic church in Korea from 1593 to 1871, he described in detail the *ondol* of the period in his book *Histoire de l'Église de Corée*. In 1882, W. E. Griffis in his book *Corea, The Hermit Nation* wrote the following about the *ondol*:

It is like the Westerners who built their beds with bricks and set a fireplace under them to keep them warm. The flue set at one end of the house from the fire opening to the pipe at the other end was covered with brick or Kang-faced stone. (as cited in William, 1894, p. 263)

Rome hypocaust systems are integrated into the building and can be used for both heating and cooling systems (Bansal & India, 1998). Bansal and Minke's (1994) research has confirmed that the hypocaust is an excellent heating system for modern buildings.

Influenced by Asian immigrants, the *kang* is also being adopted for residential heating in the USA. The heating cable device developed in the USA is based on the *kang* principle and is mainly used for highway curve snow-melting devices, which is just one part of a wider application of *kang* technology. Germany has long been interested in the *kang* heating method and has been very active in supporting it for health, energy conservation, and environmental protection.

To summarise, *kang* is found not only in most parts of northern China but also in other cold countries and regions of the world. The demand for *kang* in cold regions will continue, and it is important to focus on technological innovations. The culture behind the *kang* is the basis for keeping the *kang* adaptable to modern society for a long time. Therefore, as China is the country where *kang* is most widely used, the inheritance and development of Chinese *kang* culture is an eternal topic.

Inheritance and Development of Chinese *Kang* Culture

Chinese *kang* is the crystallisation of the wisdom of the ancient Chinese people. Different cultural backgrounds and lifestyles led to the formation of different Chinese *kang* systems. Different ethnic groups have different customs and habits, forming unique Chinese *kang* systems (Zhuang, Li, Chen, & Guo, 2009). Considering the cultural and technological heritage of the Chinese *kang*, it is unlikely that the Chinese *kang* will soon disappear from rural households in northern China in the future.

Daily life with Chinese *kang*

As an integral part of northern courtyard architecture, the Chinese *kang* fully reflects the wisdom of the working people, their habits, and the unique forms they produced in response to natural conditions. The Chinese *kang* is an accessory structure built at the same time as the building, and it can be seen as the best combination of architecture and furniture. It is a place of rest, sleep, and heating device. The rural Chinese *kang* has a rich cultural connotation. It has nurtured the civilisation of the yellow earth for thousands of years, and the Chinese *kang* has carried the life and prosperity, sorrows and joys, sowing and harvesting, rise and fall, and rise of the northern people for generations. Any Chinese *kang* is loaded with countless

touching stories. It is not only a vehicle for thousands of families to travel through life but also a cradle for the continuous progress of society (D. Li, 2021).

Li (2021) summarised the functions of the Chinese *kang* as a couch for rest, an altar for marriage, a paradise for sexual love, a cradle for newborns, a place for labour, a hall for hospitality, a temple for entertainment, a tent for decision-making, and a lounge for rest and recuperation, a total of nine aspects. The Chinese *kang* is not just a home furnishing but a synonym for home; the Chinese *kang* is not just a place to rest but also an important place for nurturing love and having children (Wu, 2017).

The interior space of the Chinese *kang* is rich in embedded memory (Figure 10). In everyday life, people like to sit, sleep, and eat on the Chinese *kang* (Fumihiro, 2003). S. Yan et al. (2022) show that the *kang*-stove system is a combination of cooking and heating systems and is the core element of the living space of many rural houses in northern China. Li (2019) talks about the intrinsic connection between Chinese *kang*'s space and food culture in his book. One of China's four great books, *Dream of the Red Chamber* (X. Cao, 1791), talks about Chinese *kang* in over 100 places in the book, reflecting the strong presence of Chinese *kang* in the daily life of the Jia family. All of the above shows that the Chinese *kang* took up most of the living space in the resident's daily life and that their behaviours were directly linked to the Chinese *kang*.



Figure 10
Scenes of life on
Chinese *kang*
(Photograph by
authors)

Y. Yan (2017) discusses changes to the Chinese *kang* space structure in private living spaces, as well as changes to the spatial layout and interpersonal relationships. He conveys that when the size of the Chinese *kang* decreases and the interior space increases, there is less interaction between people, commonality becomes relatively weak, and privacy between the inhabitants in the domestic space becomes stronger than in the past. He also argues that people no longer gather on the Chinese *kang* to watch TV on New Year's Day. This statement is somehow due to the change of lifestyle that affects the overall layout of the house as well as the importance of the Chinese *kang*. The most important factor is the evolution of residents' behaviour, etiquette, and customs, as well as the passage of time between each generation, which will finally transform life.

According to Boda et al. (2015), in the spatial study of rural dwellings in northern China, residents in some places have adjusted their spatial layout, changing the Chinese *kang* from a multifunctional space to a single-bedroom space. This transformation has changed the *kang*-centred lifestyle and the way of living in the same house for several generations. At the same time, it is also an expression of the inheritance of Chinese *kang* culture.

Chinese Kang Culture From Different Perspectives

The wide application of Chinese *kang* in the northern region and sustainable energy utilisation has a long historical tradition and important cultural heritage significance (Zhuang, Li, & Chen, 2009). The interior spatial environment is where cultural values are centrally expressed. A review of the literature reveals that international scholarship on Chinese *kang* not only explores the relationship between the layout of the interior space and the Chinese *kang*, but also that there are many related factors to its presence in the interior space. Chinese *kang* has been discussed from the perspectives of folklore, anthropology, and sociology, which are closely related to the inheritance and development of the Chinese *kang* culture.

Chinese kang from folklore perspective

The study on the folklore and cultural transformations of Chinese *kang* traces the history of Chinese *kang* in general and examines the folklore and cultural connotations of Chinese *kang* and its transformations in the modern era. Heating facilities are essential for humans living in cold regions, and there are various heating methods found in different cultures, from the heated floor known as *kang* in China, the heated floor warming method used in Korea and Japan, to what the West is collectively referred to as *ondol* (Jin, 2010). Jin (2010) found that in Korea, various cultures of the Korean people,

such as Korean clothing, Korean food, and Korean houses are closely related to *ondol* culture and that folk culture is expressed in *ondol*. D. Kim (2004) focuses on the *ondol* culture and folklore heritage of the Korean people, citing the *ondol* as an important cultural factor and discussing the profound influence of the *ondol* on food and life, rituals and customs, and folk activities.

Liu (2013) employs folklore as context for examining the folk cultural changes associated with the Chinese *kang* and finds the group psychology and cultural logic behind the Chinese *kang* a very important factor. B. Cao (2007) provides a preliminary classification and consideration of Chinese *kang* regarding culture, folklore, religion, and belief. He finds that the Chinese *kang* is a place where life forms are on full display, has many peculiar customs and distinctive regional taboos, and possesses ecological and cultural integrity, embodied in both material and immaterial forms. Wu (2017) begins the narrative with man's discovery of fire, its introduction into the house for heating, and the beginning of a way of life that revolves around the Chinese *kang*.



Figure 11
Wedding customs
around the Chinese
kang (Photograph by
authors)

Here, the Chinese *kang* is not just furniture furnishing; it is synonymous with home, not just a place to rest, but a place to nurture love, have children, and continue life. As such, the range of activities on the Chinese *kang* effectively creates a cultural atmosphere in the living space while carrying on the customs and practices of the northern regional culture (Figure 11). As a kind of folk art, the paintings around the Chinese *kang* are a cultural phenomenon originating from the lives of ordinary people and are always integrated with them. B. Wang

(2017) explores a cultural phenomenon derived from the Chinese *kang* under folk culture, using the paintings of the Chinese *kang* in Shanxi as an example. There are many more studies on the folkloristic perspective of Chinese *kang*. The shortcoming is that most of the essays focus on the needs of the Chinese *kang* from a functionalist perspective without looking at the dynamics of the Chinese *kang* as an object.

Chinese kang from anthropological perspective

Professor Mareile Flitsch, Curator of the Museum of Ethnology at the University of Zurich, explores how people discover and shape everyday solutions to social and technological challenges from an ethnographic perspective of everyday technologies for women in rural northern China (Flitsch, 2008). For women, the Chinese *kang* was an important space in their everyday work. Practical knowledge about the socio-technical gendered use of this daily living space has been embodied in a whole set of gestures, terminology, and ways of acting throughout the seasonal and life cycles of every day, of work, or in ritual contexts. This body-*kang* relationship was crucial in solving several daily routines and challenges and mitigating everyday risks. Flitsch (2008) explores the development of Chinese *kang* from an anthropological perspective of technology, from the level of the mat to the level of the chair. She uses an anthropological approach to explain the technology's emergence, transformation, and impact on human gestures and living practices. Moreover, as described many times by scholars such as Craig Clunas, the ancient Chinese techniques of squatting and floor dwelling have survived in the Chinese *kang*. The Chinese *kang* was structurally adapted to the human body. The height of the stove, the height of the Chinese *kang*, and the thermal conditions of the Chinese *kang* all influence or are influenced by the physical techniques of its inhabitants (Flitsch, 2008).

The anthropological articles on Chinese *kang* have explained the important influence of technology on human disposal on the formation of Chinese *kang*. However the descriptions of such articles are relatively short, the technological factors are singular, and the reasons behind them are not explored in depth. Several articles have captured the relationship between Chinese *kang* and the behavioural aspects of the environment. These articles have captured the interrelationship between human behaviour and the physical, social, and cultural environment in which one lives, where all elements of the environment have the potential to relate to and interact with people, and so does the Chinese *kang*. The Chinese *kang* is not only an architectural appendage or a piece of furniture but also exists in a whole environment, hence the name Chinese *kang* space.

In this Chinese *kang* space, everything that people do affects the environment around them.

Human behaviour in daily life and human body dimensions provides some guidance on the design of interior spaces. Liu (2017) analyses the relationship between indoor space, Chinese *kang*, and residents' behaviours from the theory of environmental behaviour and explores the value of Chinese *kang* in modern farmers' lives. The relationship between the Chinese *kang* and the human body may go beyond the Chinese *kang* as an intangible place where one can move, sit, lie down, or sleep. No matter what kind of material the Chinese *kang* is made of or what kind of layout it exists in, there is consistency in the behaviours that the *kang* corresponds to.



Figure 12
Table laid of the
Chinese *kang*
(Photograph by
authors)

Within a single interior space, four major types of behaviour are concentrated: hospitality, dining, resting, and placing furniture. He found that Chinese *kang* furniture was formed precisely because of the needs of the people in Chinese *kang*. A mat and a felt were laid on the Chinese *kang*, and a table and a bed box were placed on the Chinese *kang*, which could be used for eating and drinking as well as reading and writing, while the bed box held bedding and clothing within easy reach (Figure 12 and Figure 13). Song (2021) explores a unique decorative art from the Yuanping area of Shanxi province, the paintings on the wall around the Chinese *kang*. Inspired by the forms of people's daily life in the Chinese *kang* space, it is vividly and interestingly represented in paintings on the walls around the four sides. There is a unique system of human behaviour patterns in the Chinese *kang* environment. We can use this knowledge to improve

the physical environment and enhance the quality of human life. We can use this knowledge to improve the physical environment and enhance the quality of human life.

The above article briefly describes the connection between a particular kind of furnishing in the *kang* space and human behaviour. For example, the influence of human needs on furniture furnishings and the form in which human practices of everyday behaviour are reflected in the *kang* space in the form of paintings. This study needs to add the reasoning behind the relationship between these furnishings and residents' behaviour to better understand the interaction between the furnishings and residents' behaviour within the *kang* space (Duanmu et al., 2017). Although the above descriptions are very few in terms of the relationship between Chinese *kang* and people, it is still clear that Chinese *kang* is being studied in many countries worldwide. Attempts are being made to pass it on and integrate it more appropriately into people's modern lives.

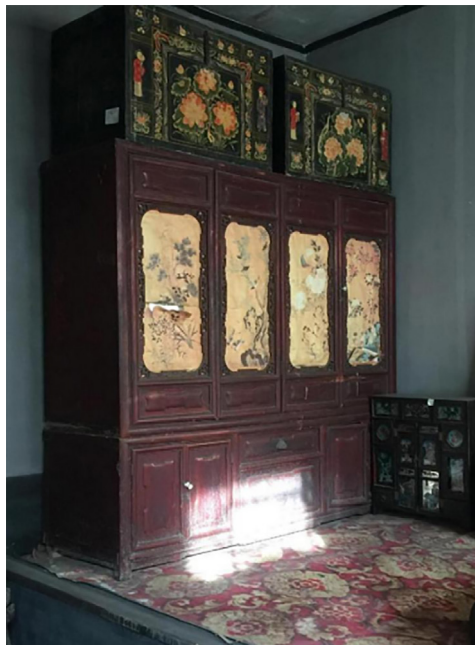


Figure 13
Wardrobe placed on
the Chinese *kang*
(Photograph by
authors)

Chinese kang from sociological perspective

From a sociological point of view, the Chinese *kang* is a centre where family activities take place, and its social role cannot be ignored. Therefore, when considering the continuation and transformation of thermal energy technologies, it is important not to lose sight of the cultural aspect (Zhung, Li, Chen, & Guo, 2009).

Gramont (1771) recorded how the Chinese *kang* was used by the royal family and the ordinary people, revealing how different classes understood the culture of the Chinese *kang*. People with low income preferred to heat their homes by fire, keeping warm on their Chinese *kang* during the day and sleeping on their Chinese *kang* at night, and they placed their stoves next to their Chinese *kang*. The middle class, who put their stoves in the next room, regarded the Chinese *kang* as nothing more than a necessary amenity in their daily lives to provide food and shelter. The royals kept their stoves outside and moved them behind the north wall.

To expel the smell of smoke from the air, the people with low incomes always keep bowls of water in their rooms and change them for new ones from time to time. In the imperial palaces, the rooms of the emperors were adorned with flowerpots and orange trees, which the Chinese philosophers considered the best way of purifying the air, as they hated the particles of iron dispersed in the air. The gold served in bowls was a form of decoration and wealth, and the people valued spiritual culture after their material needs were satisfied.

In summary, previous studies show the relationship between Chinese *kang* and people from various disciplines, each with its distinctive characteristics and intersections. The Chinese *kang*, as a necessity for residents of northern China, is an essential part of their everyday life. However, some existing scholarly research has been less concerned with the relationship between the Chinese *kang* and people, why the Chinese *kang* exists, and what it means in people's lives. Most studies include the historical origins of Chinese *kang* as part of the narrative. Thus, the role of the Chinese *kang* in the *kang* space is dominated by functionalism, the role of residents' behaviour in the space, as well as the relationship that occurs with it, tends to be ignored.

Conclusion

The onslaught of modernisation has made people feel the importance of traditional culture more and more. The Chinese *kang* is both a physical device of domestic architecture and a symbol of Chinese civilisation. It symbolises the collective, family-based nature of Chinese society, the interpersonal relationships established by the Confucian system, and the economic and social ties based on mutual dependence and trust. The Chinese *kang* culture is so profound that for a long time, not only did the people sleep on the Chinese *kang*, but dignitaries slept on the Chinese *kang*, and even the emperors slept on the Chinese *kang*. Nowadays, the Chinese *kang* has been replaced by a bed in many young people's rooms, although it can still be seen in some older people's rooms. Therefore, it is of great practical

significance to study the changes in the shape of the Chinese *kang* and advocate the effective use of the Chinese *kang* to promote the traditional Chinese *kang* culture and optimise people's lives.

This study argues that the Chinese *kang* is not only an existence of material culture but also contains many connotations of spiritual culture behind. Revealing the culture of the Chinese *kang* requires its investigation in the context of regional culture, indoor space, and human beings. The study raises further questions about how the relationship between people and interior space, extended by the Chinese *kang* as an entry point to traditional culture, can guide modern interior design. However, this study may not provide the 'right answers,' but it may lead to valuable questions, surprising connections, and new insights into human relationships, providing new perspectives on hitherto unquestioned views.

The Chinese *kang* is not only a survival necessity to cope with the cold but also a catharsis of people's feelings and an expression of their psychological needs. While people enjoy all the conveniences brought by modernity, they have not lost their traditional culture, which is deeply rooted in their lives.

This paper's overview of Chinese *kang* culture will hopefully inspire other international researchers, especially those interested in interior spatial culture research, and provide new references for Chinese *kang* culture researchers all over the world to inherit the Chinese *kang* culture while preserving the Chinese living culture and enriching the cultural system of interior research. The value of the intangible Chinese *kang* culture can be integrated into the tangible modern living space and developed in the process of modernisation.

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