Experiential Analysis of the Vernacular: South Korea's Gudeul System

Jieheerah Yun*

*Assistant Professor, Department of Architecture, Hongik University, Korea

Abstract
This paper looks at the experiential aspects of the traditional Korean houses known as hanoks. It does so through an examination of the recently rising popularity of the gudeul heating system for use in hanoks.

Very recently, remodeled hanoks have become very attractive in the context of the highly uniform housing market of South Korea. Yet hanoks continue to present many inconveniences such as preparing firewood for the gudeul. While some have evaded this problem by modernizing their heating system, others stick to the traditional heating system, arguing that modern heating systems are untrue to the essence of the vernacular house. This study examines the source of the popularity of this traditional heating system despite the inconveniences associated with it. By employing ethnographic as well as archival methods, this study concludes that the popularity of vernacular heating systems comes from their effects on the senses, both tactile and olfactory, rather than satisfying a merely functional need of providing warmth.

Keywords: vernacular; hanok; remodeling; tradition; memory

1. Introduction
Many scholars have been debating the applicability of the concept of vernacular architecture. As the distinction between vernacular and high architecture becomes in many places more ambiguous, some have argued against applying the concept of "vernacular" in architecture. However, the vernacular continues to appeal to many, and various forms of vernacular houses continue to be built alongside houses built by professional architects. In the case of South Korea, remodeled hanoks have become very popular among the middle-aged and elderly. "Hanok" literally means Korean-style house, and it can include a wide range of traditional houses, from thatched-roof to tiled-roof houses. Since the Bukchon Regeneration Project in Seoul in 2001, which involved new constructions as well as conservation of old hanoks, many cases of remodeling hanoks have been reported in the South Korean media. Accordingly, many studies about improving the quality of living in hanoks have been carried out. Scholars such as Bonghee Jeon have analyzed the evolution of hanok styles and suggested new terms to distinguish different kinds of hanok around South Korea (Jeon and Gwon, 2012).

One of the features that distinguish traditional hanoks from remodeled hanoks is the presence of the traditional heating system known as a gudeul. The gudeul is sometimes also called the ondol, which in fact refers to the even older traditional underfloor heating system. Along with a daechung (raised wooden floor), a gudeul makes a hanok a unique house type which suits Korean climatic conditions marked by humid summers and icy winters. Since keeping a gudeul involves much labor, including gathering firewood, many remodeled hanoks have instead opted for a modernized boiler ondol, which uses water pipes. However, some Koreans insist that a traditional gudeul is an essential feature of a hanok, and that hanoks with boiler-ondols are hanoks in name only. New vernacular houses that have gudeuls while doing away with the costly traditional bracket system have emerged as well. This popularity of the traditional gudeul is surprising given the functional superiority of boiler ondol and the practical difficulty of maintaining a gudeul. Experts in thermal dynamics argue that heating by boiler ondol is not dissimilar to that by gudeul; some consider a boiler ondol is an improved version of a gudeul (Kim et al., 1999). If this is the case, why do many Koreans with a past experience of living in hanoks consider a traditional gudeul better than a contemporary boiler ondol?

This paper attempts to answer this question by looking first at hanoks, and the gudeul heating systems typically used in them. The author employs archival methods in examining various scholarly studies of the gudeul and boiler ondol, while using an ethnographic method, conducting surveys and ethnographic interviews. In the survey the author asked...
124 respondents, who either were currently or had previously lived in hanoks, what the most important feature of hanoks were in their opinion. The author also conducted participant observation research by visiting guesthouse hanoks and joining a gudeul-making program designed for the general Korean public. The study concludes that the popularity of the traditional heating system comes from its provision of a range of satisfactory sensory experiences, including those related to the tactile and olfactory senses, rather than a purely thermal satisfaction. While those who adhered to the use of gudeuls were aware of the difficulties related to this heating system, they were attracted to the holistic experiences that could be associated with gudeuls, including ideas of the reconstruction of sensory memories. The author first discusses the relevance of sensory memories in architecture as a supplement to archival research and then turns to describing the history of hanoks and gudeuls. Finally, she draws certain conclusions based on ethnographic fieldwork as well as a review of the relevant literature.

2. Sensory Memories and Architecture

When studying built environments, architectural historians have mostly relied on archival research in order to understand the meaning behind a given form. Yet, as recent researchers have observed, such a limited approach contains the risk of emphasizing the viewpoints of the patrons and designers and excluding those of users. Historians have started to examine monuments, such as memorials, to understand the relationship between memory and history. So-called unofficial histories, which are ingrained in the memory of individuals and groups of people, have attracted scholarly attention. For instance, James E. Young (1993) has contributed an important volume on memorial architecture by focusing on Holocaust memorials. Other types of architecture, such as shrines and towers, may invoke a certain sensory memory as well. Wu Hung has discussed how the memory of sound is central in the reconstruction of spatial perceptions of the drum tower in Beijing (Hung, 2003).

The "memory boom" in academia did receive some critical scrutiny. Some have pointed out that memories are prone to alteration and fabrication. However, even modifications of memory can indicate important societal presuppositions and cultural beliefs. Maurice Halbwachs has remarked that collective memory is the "[reconstruction] of an image of the past which is in accord, in each epoch, with the predominant thoughts of the society" (Halbwachs, 1992: 40). The sociologist Barry Schwarz has argued that cohesive history would not exist in the absence of a cumulative dimension of collective memory (Schwarz, 1982). Thus, historians need not always assume that the relationship between memory and history is antagonistic. It may be that personal memories can usefully supplement official histories.

In non-monumental architecture, the importance of memory becomes even greater, as historical records about non-monumental structures are more difficult to find. Although memories are selective and sometimes not perfectly accurate, they are useful in supplementing official records in understanding vernacular architecture and its spatial practices. It is the aim of this study to examine not just sites of memory but also those that produce and consume memories, by looking at both the use of gudeuls in hanoks and at some of the residents who seek to create a related lifestyle.

---

3. A Brief Introduction of Hanoks

The term hanok, which etymologically means a Korean-style house, is today really an umbrella term that covers a wide array of traditional and vernacular houses in Korea. While it is not certain exactly what the scope of the term is, many scholars have agreed that the most distinctive feature of hanoks is the integration of daechung (raised wooden floor) and gudeul (also called ondol, a traditional floor heating system) (Fig.1.). A raised wooden floor is suitable for hot and humid weather, and it is a feature often seen in Southeast Asian countries. For the heat that they provide, gudeuls can seem essential during icy winters.
Hot air generated by a kitchen-stove travels underneath the floor, and this generates layers of heat within a room (Fig.2.). Since the Korean peninsula is affected by both summer monsoon rains and Siberian winter winds, these two features together help to control the indoor climate.

Political and philosophical ideologies have also played a role in determining the organization of space in hanoks. For instance, Confucianism, which emphasizes values such as filial piety and the separation of genders, required separate and independent buildings for different purposes. The division of interior spaces into an-chae (private quarters), sarang-chae (study for male family members), and sadang (the family shrine) in the later Choseon Dynasty (1392-1910) can be traced to the spread of neo-Confucianism in that period (Fig.3.).

After the opening of Korea's ports in the late nineteenth century, hanoks were frequently adapted to demands of urbanization and modernization. Some rich intellectuals started to use new materials such as bricks and glass in their homes. During the Japanese colonial period, from 1910 to 1945, a series of city planning projects had the effect of dividing land parcels into smaller pieces, resulting in the emergence of urban hanoks with only one courtyard (Song I, 1988).

After the Korean War, hanoks went through another phase of change as the Saemaul ("new village") Movement in the 1960s and 1970s promoted the use of new roofing materials. Most thatched-roof houses disappeared, as they were regarded as a sign of economic underdevelopment. With the aggressive promotion of condominium living, many hanok dwellers sold their houses and moved into "modern" flats. It is only in the 2000s that hanoks, or more accurately, remodeled hanoks, became a trendy residential option. Even with the so-called "hanok renaissance," remodeled hanoks remain costly due to the high level of skilled labor involved in their construction. Hanoks rely on the bracket system, which is very complex and requires traditional craftsmanship.

4. Sensory Memory of Gudeul
The origin of the term gudeul and its synonym ondol is unclear. Some scholars, such as the folklorist Jin-tae Son, argue that the term gudeul comes from a Korean phrase for "heated stone" (Gu-ŭn-dol), while others think the word came from a Korean word for "harden" (Gut-da or Gut-ŭn), since making a gudeul involves hardening rammed earth (Kim J. et al. 2014). According to one study, Koreans started to use the gudeul as a heating system as early as the third or fourth century C.E. (Kim N., 2004). By the eighteenth century, it had spread even to Jeju, the largest island located to the south of the Korean peninsula (Song K., 2008).

Some residents who are less concerned about the benefits conferred by following traditional hanok construction have opted for less conventional houses that may or may not be called hanoks by the standards of historians. For instance, many new vernacular houses in South Korea do not have a bracket system and rely instead on pre-fabricated doors and windows (Yun, 2014). Yet even these less ostentatious new vernacular houses have a daechung and a traditional gudeul, as these are considered central features of hanoks. While this shows a privileging of experiential and functional features over stylistic concerns, it does not explain why a traditional gudeul would be preferred over a boiler ondol.

Scholarly works dealing with gudeuls generally present the benefits of traditional gudeuls as follows. First, the traditional gudeul is qualitatively different from the boiler ondol because the former circulates hot air instead of hot water. Secondly, the superiority of the traditional gudeul comes from the fact that it uses organic materials like wood to produce heat, instead of relying on electricity. Therefore, it is supposedly more sustainable. While we lack scientific evidence on this, some believe that infrared rays produced by burning wood are good for the health, preventing for instance many gynecological diseases. It has also been found that the popularity of gudeuls indicates a cultural preference for a traditional lifestyle and value system. According to an article published in a Korean agricultural engineering journal, the abandonment of traditional gudeuls has resulted in the weakening of traditional values such as that of the importance of caring for the elderly (Lee, S., 1998).

There are many arguments against the superiority of gudeuls and vernacular heating systems. As Al-Sayyad and Arboleda (2011) have pointed out, the belief that vernacular architecture using natural materials is more sustainable needs to be examined against concrete data before it is accepted as a fact. There is no published data supporting claims for the health benefits of the infrared rays produced by gudeul. The relationship
between their use and traditional value systems is even less tenable, given a lack of evidence. On the other hand, many South Koreans, including people without an architectural background or knowledge of thermodynamics, know that using a gudeul can be very cumbersome, given the amount of firewood needed. What then is the source of the gudeul's continued popularity among middle-aged and elderly Koreans? What is the basis of the belief that a traditional gudeul is better than modern methods of heating?

The relationship between the two begins to become clear when sensory memories associated with the use of gudeuls, are considered, along with the hierarchical spatial order normally involved in the production of thermal comfort. What some South Koreans think about the relationship between heating and the value systems could be glimpsed from an interview with a former hanok resident. Hong, in his late '50s, who had lived in a hanok until he graduated from middle school in the 1960s, noted that living in a hanok was "very, very cold, to the extent that damp rags froze." He remembered the hanok's interior space as having a hierarchical order according to the degree of thermal comfort. Since the gudeul's heat source was located on one wall, the room's temperature, especially that of the floor, varied as well. The lower section of the room (called the aret-mok) was closest to the heat source, and thus the warmest. The upper section (called the wit-mok) was farthest from the heat source, and thus the coldest although they were located on the same level. This hierarchy of thermal comfort was directly translated into a social hierarchy within the family structure. Hong noted,

When my father was home, he would take up the aret-mok, since he was the oldest person in the room. But when grandmother came in the room, he would move downward and yield the aret-mok to her. The other family members would simply move a bit upward to the wit-mok.

As mentioned earlier, some older South Koreans believe that the absence of such a thermal hierarchy in contemporary houses contributes to a weakening of traditional values since the young do not learn to yield the better spot to the elderly. However, there are no studies on the subject. Hong, when asked about this, remarked, "Isn't it better if the room temperature is even and everyone is warm?" Perhaps, as the younger family member, he did not enjoy the experience of having to sit or sleep on the colder wit-mok. For him, the advantages of a balanced distribution of heat resulting from a water boiler system outweighed the benefits of cultivating a good value system.

There are other types of sensory memories which also contribute to the positive perception of a traditional gudeul. For instance, the hanok of Mr. Choi Hyeok Jae, in Chungbuk Province, has a traditional gudeul heating system. While other designated hanoks have long used water boiler ondols, Choi noted that he had decided to spend his own money (without receiving government aid) to finance the installation of a revolving gudeul. The revolving gudeul is a recently patented heating mechanism developed by Ahn Jin Geun, who improved the traditional gudeul system by maximizing the time that warm air is captured inside. Instead of circulating hot water, this mechanism requires wood burning, just like the traditional gudeul system. Choi explained that the wood burning system is very different from that of a water boiler, since the experience of a gudeul is not only tactile but also olfactory. The smell of burning wood is another form of memory associated with the traditional heating system. In fact, visitors in his house could sense a slightly smoky air in the room, though it did not reach an uncomfortable level. He explained that slight changes in room temperature depending on the room's height produce a variety of tactile experiences. For instance, the floor is almost hot, the lower section of the room warm, and the upper section somewhat cool. This produces noticeable contrasts depending on the resident's posture (such as lying down, sitting, or standing up). In addition, he believed that burning wood is better for an inhabitant's health.

While the medical benefits of having a wood-burning ondol have not been established, Choi's view is echoed by many middle-aged Koreans who love hot floors. Many talk fondly about the experience of "searing one's backside" in gudeul-heated rooms (N. Kim, 2004: 13). In a survey that asked what the most important feature of a hanok is, 68 Korean respondents (out of 124) cited the gudeul. Some believe that the experience of sitting in a room heated by one is useful for treating arthritis and rheumatism. Others have suggested a connection between red clay, the material in gudeuls for their interior finish, and good health, since the red clay helps to control the humidity of the interior air. To be sure, along with other features of these dwellings, the positive association with hot floors is an acquired taste, and younger generations unfamiliar with hanoks tend to not particularly care for it. Even in the absence of corroborating evidence, belief in the gudeul's health benefits is one of the reasons why traditional hanoks have appealed to many middle-aged Koreans.

In interviewing many hanok dwellers as well as conducting participant observation, the author found that many spoke of their appreciation for sensory memories. In distinguishing between an appreciation of an experience elicited by an environment on the one hand, and of its stylistic features on the other, we can find that priority is given sometimes to one, sometimes to the other. It seems that potential buyers and inhabitants appreciate both historical and novel approaches to the invocation of positive spatial experiences by hanoks. This can be seen in the widespread integration of modern technologies in
traditional hanoks. For instance, Mr. Choi Hyeok Jae's hanok had air conditioning just like apartment houses, but it also had a traditional wood burning heating system. He did not see the choice of this as inconsistent or contradictory, as he recognized that many other historic hanoks also integrated air conditioning in order to mitigate the hot and humid summer weather. Thus, a preference for a traditional gudeul should not be understood merely as a desire to live in a dwelling that accurately represents a prized historical form (and so can authentically recreate an experience posited as originating from it). Rather, it is better understood largely as merely reflecting the perceived need for a hierarchical gradation of different levels of warmth. This is what by comparison is most lacking in many contemporary South Korean apartments with uniform thermal control, even those with a boiler ondol. But then too, contemporary boiler heating systems cannot match the faint smell of smoky air in wood-burning gudeuls.

The use of a traditional gudeul also means that there is more of a height difference between interior rooms with or without a gudeul. The floor level of the gudeul room is always slightly higher than that of other interior spaces because of the gorae, or (usually sloped) earth beneath it. This results in a slight variation in floor heights within the single-story building. For instance, many remodeled traditional hanoks include an additional bathroom next to the gudeul room, an outdoor privy that is generally found very inconvenient. As Fig.4. shows, the floor of the bathroom is usually a bit lower than that of the gudeul room. While this may be inconvenient compared to homes with contemporary urban designs, many former residents of hanoks have positive experiential recollections of these slight differences in floor level. One woman in her early '60s said that "it was fun" living in a hanok because of the varied spatial experiences to which it gave rise. Many Korean houses built in the 1970s and 1980s had remnants of this. Although the difference in floor height was not as marked as in traditional gudeul houses, many houses had a mun-tuck (raised door sill) in each of the interior doorways to distinguish one interior space from another. Mun-tucks started to disappear as cases of their being tipped over, especially small children, made their presence a nuisance. In most contemporary apartments and houses, the floor is even throughout the house, and the interior space has become integrated into a single surface.

In one hanok guesthouse at Yangdong Village, located in the city of Gyeongju, the guestroom, equipped with its own gudeul, adjoined a bathroom. From the exterior, this bathroom looked rather like a makeshift structure that did not seem to fit into the overall aesthetics of the house. However, it served several important functions. In addition to providing an indoor bathroom that was much more convenient than an outdoor bathhouse would have been, it also protected the adjoining bedroom from drafts. The difference in floor levels distinguished this addition from the rest of the interior space. In fact, visitors had to crouch to access the bathroom; not only did it have a lower ceiling; its door was also much smaller than the other doors (Fig.4.). This structure is an unmistakable result of using a traditional gudeul instead of a boiler ondol.

Enjoyment of the warm floor served for many hanok dwellers as compensation for this inconvenience. Some spoke of childhood memories of playing "hide and seek" in complex hanok structures by, for example, hiding beneath the raised daechung floor. Other former residents also recalled that many of the various independent structures (called chae) sometimes found in hanoks, such as a huh-chung (granary), had provided ample hiding places for children playing such popular games. As even the inconvenient aspects of hanoks were given a new meaning, former residents found themselves able to reinterpret their spatial memories as "fun" or "interesting," rather than inconvenient or dangerous.

Reflecting the popularity of traditional gudeuls, some rural villages in South Korea have developed short-term educational programs intended for people who want to learn about the gudeul system. Hwango Gudeul Village, located in Pyongchang, a mountainous region in Kangwon Province, runs an educational program about gudeuls for non-experts (Fig.5.). In May 2014 when the author was visiting, the participants in the three-day-long program included a couple in their '60s who lived in downtown Pyongchang and a middle-aged carpenter from Seoul. One man complained about his experience with them: "There are too many ulchigi (hack) gudeul makers. I only spent money without getting any benefits." His wife asked the instructor, "What do you do with all the smoke in the room when you burn wood?" The couple was unsatisfied with the gudeul installed in their house, as it was not
functioning properly. As it happens, in the absence of any licensure for tradesmen specialized in gudeul making, quality control is difficult.

Yim, the instructor at Hwangto Gudeul Village, notes that anyone can make a gudeul, once (s)he has understood its basic principles. The persons installing them often are not in this category. According to Yim, gudeul making does not require expert knowledge. It was something that village elders all knew how to do, and they would pass it down to the next generation "by word of mouth." Yim affirmed, "It seems to me wrong to categorize it as some expert knowledge; at least that's how I feel about it." This comment reveals the presence in South Korea today of a deep cultural gap, doubtless produced by the country’s rapid urban modernization over the last generation. There seems to be a broad cultural resistance that is emotionally marked against designating what used to be common knowledge as something rare and extraordinary.

But it seems that many ordinary people find it difficult to learn how to make a gudeul. Learning this is one thing, and maintaining a gudeul room is another. Even Yim, the gudeul aficionado, noted that having a house with a gudeul means gathering firewood and burning it daily. At the time of our interview, he had not been able to go on a trip for more than a day (except during summers), since his wife had made him promise that he would continue to see to the wood burning in the event that they moved to a rural village. Thus, he recommended that participants have available alternative heating systems, rather than relying only on this one alone. Reflecting a changed lifestyle, many dwellers of traditional hanoks have had their ahn-bang (master bedroom) floor altered to fit a water boiler system, even when renting out other rooms with traditional gudeuls. In this way, hanok residents can selectively appropriate the features to include in their houses according to the purpose which they envision a certain room as having.

Memories are altered as time passes, and selective memories often cause one to forget different aspects of spatial experiences. What the process of selective appropriation of typical hanok features involves becomes clearer when one considers that not all middle-aged South Koreans have favorable memories of living in hanoks. Yet, the popularity of hanoks among the middle-aged and elderly suggests that most positive associations with hanoks come from sensory impressions. Researchers studying vernacular architecture have started to question the primacy of visual representations, emphasizing instead the performative aspect of vernacular architecture (Garfinkel, 2006). Performance of a given work of vernacular architecture may include features that are not crucial to maintenance of the structure but can enhance an inhabitant's overall spatial experience, and they do so by satisfying culturally determined tastes. Tactile experiences, such as feeling one's back resting on the hot floor, and olfactory memories like the scent of wood burning, constitute a very important aspect of hanoks and help explain the recent Hanok Renaissance. Simply replicating historical forms of hanoks without consideration of this could lead to decreasing demand for remodeled hanoks.

5. Conclusion

In this paper the author has analyzed the gudeul system used in traditional hanoks, including how it is related to sensory and spatial memories. While there is no scientific evidence that gudeuls are superior for heating to boiler ondols or other types of heating systems, many South Koreans with past experiences of living in a gudeul room favored the device over alternatives. There is some evidence to suggest that the popularity of gudeuls has to do not only with thermal comfort but also with the provision of certain kinds, and varieties, of sensory experiences. Sensory experiences associated with gudeuls include tactile and olfactory memories, such as feeling a hot floor or the smell of burning wood. Although such sensory memories might be presumed secondary to
thermal comfort, they are an important part of the architecturally situated experience that has made gudeuls, and also hanoks more broadly popular among older Koreans. However, other factors associated with the dwelling, such as sustainability or traditional ambience, may also be at work.

Besides gudeuls, there are other traditional features of hanoks with associated spatial memories. The rich array of sensory experiences associated with Korean vernacular houses contrasts with homogeneous and systematic climate control systems used by contemporary residential structures. This means that their increased comfort may go hand-in-hand with flattened sensory experiences that reduces enjoyment of the lived-in space. Further studies of the sensory images associated with hanoks and other traditional houses in East Asia are a needed supplement to the dominant tendency in looking at vernacular architecture to focus mostly on its aesthetics. For the "sensational" character of these kinds of dwellings clearly forms an important part of what makes them attractive to so many people.

Acknowledgement
This work was supported by the Ministry of Education of the Republic of Korea and the National Research Foundation of Korea (NRF -2013S1A5A8020542).

References