

Phenomenological approach on the role of sonic heritage as an intangible heritage

Abordagem fenomenológica sobre o papel do patrimônio sonoro como patrimônio imaterial

Hyuk-Jin Lee

Ph.D in Library and Information Science

Institution: Texas Woman's University

Address: 304 Administration Drive, Denton, TX 76201, U.S.A

E-mail: hlee@twu.edu

ABSTRACT

It is important for us to understand how our cognition is composed of different types of experiences of an object as it is closely related to our recognition of cultural heritage. In addition to visual information, with the emergence of the soundscape field, it would be necessary to understand our cognition on auditory information including sonic heritage. Therefore, in this study, the philosophical importance of auditory information as an intangible heritage is discussed from the phenomenological point of view. In addition, phenomenological classification for sonic heritage is developed, which would help our analytic understanding of the relationship between our cognition and different types of sonic heritages. Finally, Virtual Reality (VR) may provide different experiences from those of the real world. Understanding the experience of VR has been discussed including the possibility of synergic effect of utilizing both visual and auditory information.

Keywords: sonic heritage, acoustic heritage, archaeoacoustics, phenomenology, virtual reality.

RESUMO

É importante para nós entender como nosso conhecimento é composto de diferentes tipos de experiências de um objeto, pois está intimamente relacionado ao nosso reconhecimento do patrimônio cultural. Além das informações visuais, com o surgimento do campo sonoro, seria necessário compreender nosso conhecimento sobre as informações auditivas, incluindo a herança sonora. Portanto, neste estudo, a importância filosófica da informação auditiva como patrimônio intangível é discutida do ponto de vista fenomenológico. Além disso, é desenvolvida uma classificação fenomenológica para a herança sonora, o que ajudaria nossa compreensão analítica da relação entre nossa cognição e diferentes tipos de heranças sonoras. Finalmente, a Realidade Virtual (RV) pode proporcionar experiências diferentes daquelas do mundo real. A compreensão da experiência da RV tem sido discutida, incluindo a possibilidade de efeito sinérgico da utilização tanto de informações visuais quanto auditivas.

Palavras-chave: patrimônio sônico, patrimônio acústico, arqueoacústica, fenomenologia, realidade virtual.

1 INTRODUCTION

Auditory information is one of the most important components comprising the intangible heritage. According to UNESCO (Rancier 2019), oral traditions and expressions are intangible heritage type which includes proverbs, riddles, tales, legends, myths, epic songs and poems, charms, chants, songs, and more. Recently, there have been discussions on including non-human sounds, so called, sonic or acoustic heritage to the scope of intangible heritage. As a related field, archaeoacoustics is the study of the role of sound specially in historical artifacts and sites. This field allows the sound of a space to be analyzed using energy and time acoustic parameters, recovering the acoustic memory and the immaterial atmosphere of the space, and its acoustic dimension within the space as a new approximation to knowledge of intangible cultural heritage (Suárez, Alonso, and Sendra 2016, 571). According to Murphy et al. (2017), acoustic heritage is one aspect of archaeoacoustics, and refers more specifically to the quantifiable acoustic properties of buildings, sites, and landscapes from our architectural and archaeological past, forming an important aspect of our intangible cultural heritage. They argued that acoustic heritage translates between the concepts of both tangible and intangible heritage. And fundamentally, it is founded in physical, tangible aspects of our past environments that give rise to the intangible: the acoustics of, and sounds associated with, these spaces, and our experiences of them (Murphy et al. 2017, 1).

1.1 SONIC (ACOUSTIC) HERITAGE PROJECTS

In 2014, the International Organization for Standardization (ISO) officially defined Soundscape as “acoustic environment as perceived or experienced and/or understood by people, in context”. And recently, one of the most interesting areas of research and experimentation regarding soundscape is that of cultural heritage (Bartalucci and Luzzi 2020, 2). Bartalucci and Luzzi (2020) argued that sounds are a part of the identity of places and studying them from a historical, naturalistic, and social point of view could help to safeguard and enhance them. Till (2014) introduced 'Sound archaeology' and described that

sound within an archaeological study as part of the context and a part of the environment. Primeau and Witt (2021) explained, "By considering the sounds heard by people moving through the landscape, we are able to more fully understand their culture, and thus better relate to them as human beings.....The landscape or space in which cultural sounds are produced is not a neutral universal container; it is where the social and material world convene and coalesce with the body.....The phenomenological approach is therefore deeply tied to sensory experience, and auditory perception is just one of the many ways that people experience, find meaning, and negotiate identities in their world."

Hoeven argued that on a collective level, there is also a connection between music, memory and identity. In addition, particular music can be historically associated with, for example, generational or national identities (Van der Hoeven 2014, 12). He also emphasized the importance of locality of music and regarded music as the sociocultural production of place (Van der Hoeven 2014, 18). Therefore, there have been several projects and studies in preservation or restoration of local sound. As a representative example, the Europeana Sounds project deserves special attention because it not only allows the users to access to its audio archives with more than one million audio documents, but it also focuses on promoting a creative reuse of the recordings (Borowiecki, 2016, p. 42). Bennett (2009) introduced that music fans preserved the music heritage of the city of Canterbury in England via internet space and they drew upon various digital communication methods in order to share their understanding of the sonic history. Yelmi, Kuşcu, and Yantaç (2016) also argued that sounds are crucial identifiers for cultural memory containing emotions and cultural identity, and the traditional practice has a unique sonic value in cultural identity and cultural memory of the local society. Thus, they collected and analyzed urban sounds of Istanbul in Turkey as intangible cultural heritage elements and turned the action of protecting sounds into a collaborative work. Their 'Soundsslike project' is a crowdsourced online sound archive which invites people to record symbolic urban sounds and upload them to the online sound archive. (Yelmi, Kuşcu, and Yantaç 2016, 1). Recently, Hassan and Taha (2020)

investigated the impact of urban soundscape and analyzed its characteristics and elements and its effect on identification of traditional Baghdad city in Iraq. Djimantoro and Sakina (2020) also recorded Indonesians' perceptions of the sound environment in several cities in Indonesia. They aim to describe the soundscape patterns of residential areas in Indonesia. Ferrarini and Scaldaferrri (2020) focused on the role of sound in the formation of local identities in Basilicata in Italy. They termed 'sonic ethnography', which was based on thirty years of fieldwork and research combined with a work of photographic interpretation which were developed over two decades. This study reveals how, during local sound events, tradition was made and disrupted, power struggles take place, and communities are momentarily brought together in shared temporality and space. Meanwhile, Goodwin and Richards-Rissetto employed geographic information system (GIS), 3D modelling, and VR to explore the role of acoustics in ritual performance and differential audience experience in ancient Maya city of Copán (Goodwin and Richards-Rissetto 2017, 1). Finally, Sheets and Mahoney (2022) analyzed the acoustical properties of a replica of a domed earthen Temazcal (or sweatbath), which was precisely modeled after the ancient sweatbath uncovered at the 7th century Maya village of Joya de Cerén, El Salvador.

Thus, many scholars have explained the importance of sound as intangible heritage. However, the role of sound including sonic heritage in cultural study has not been theoretically discussed enough. Therefore, in this study, the philosophical importance of auditory information is discussed from the phenomenological point of view.

2 PHENOMENOLOGICAL CLASSIFICATION OF CULTURAL HERITAGE

Edmund Husserl, the father of phenomenology, argues that we know the world not through pondering it (à la Descartes) but rather through daily life, experience, and perception. Conscious, intentional, bodily engagement with the physical world is the starting point for all knowledge (Van Dyke 2014, 2). Van Dyke (2014) explained that phenomenological archaeology is based on the assumption that there are universal similarities in human spatial perception.

Thus, it is important for us to understand how human cognition is composed of different types of experiences of an object as it is closely related to our recognition of cultural heritage. In addition to visual information, with the emergence of the soundscape field, it would be necessary to understand cognition on auditory information including sonic heritage. Here, we should first define what cognition means. According to Online Etymology Dictionary, the definition of cognition is as follows: *cognition (n.) mid-15c., cognicioun, "ability to comprehend, mental act or process of knowing," from Latin cognitionem (nominative cognitio) "a getting to know, acquaintance, knowledge," noun of action from past participle stem of cognoscere "to get to know, recognize," from assimilated form of com"together" (see co-) + gnoscere "to know," from PIE root *gno- "to know." In 17c. the meaning was extended to include perception and sensation.*

In this definition, cognition is the ability of comprehension, mental act, or process of knowing and it includes perception and sensation. However, there are still active debates on the scope of its definition. As Bayne explained, some definitions of cognition may be better than others, but there seems no single definition which may cover all legitimate uses of the term. Thus, any definition of cognition must involve a certain amount of stipulation (Bayne et al. 2019, 608). For example, a separation of perception from cognition still remains a live issue (Allen 2017, 4234). Chittka explained that the concept of cognition has been considerably broadened by some to include the mechanisms by which animals acquire, process, store, and act on information from the environment (Bayne et al., 2019, p. 610). In contrast, Tomasello and Rakoczy (2003) characterized the uniqueness of human cognition as the social historical product of collective cultural products created by many different groups of individuals over historical time. They explained, "and so if we imagine a human child born onto a desert island, somehow magically kept alive by itself until adulthood, it is possible that this adult's cognitive skills would not differ very much, perhaps a little, but not very much from those of other great apes" (Tomasello and Rakoczy 2003, 122). Due to the fact that this definition focuses on the social historical aspect of human cognition, which is closely related to Phenomenology, the scope of cognition in

this study will be focused on human cognition based on the study by Tomasello and Rakoczy.

Lee (2019) emphasized the importance of analytic understanding of how cognition is composed of different types of experiences of an object. For this purpose, he developed eight types of cultural heritage within the human brain or cognition through phenomenological analysis, called "Phenomenological classification of cultural heritage" (see Table 1).

Table 1: Phenomenological classification of cultural heritage

	Empirical Existence		Non-empirical Existence
Positive Self-identity	Real object	<ul style="list-style-type: none"> • Physical object • Virtual Reality (VR) • Still image • Text 	Mental model with intentionality
	Real imaginary object		Imaginary mental model with intentionality
<ul style="list-style-type: none"> • Virtual Reality (VR) • Still image • Text 			<ul style="list-style-type: none"> • Virtual Reality (VR) • Still image • Text
1. Negative Self-identity	Unrecognized object		Unrecognized mental model without intentionality
	Unrecognized imaginary object		Unrecognized imaginary mental model without intentionality

In this table, the horizontal axis means physical presence and the vertical axis is human cognition. 'Empirical Existence' category indicates something that exists physically in the real world. 'Non-empirical Existence' is something that had existed until some point in history but disappeared for several reasons. Meanwhile, 'Positive Self-identity' indicates something that a person recognizes as an existing thing. Vice versa for 'Negative Self-identity'. 'Imaginary' defines objects or cultural heritage that were created in imagination such as fairies. As a result, there are four types of heritage except the imaginary object categories:

- Real object: something existing in the physical world and people are recognizing it.

- Unrecognized object: something existing in the physical world and people are not recognizing it.
- Mental model with intentionality: something that does not exist in the physical world, but people are recognizing it.
- Unrecognized mental model without intentionality: something that does not exist in the physical world and people are not recognizing it. The point of developing four categories is to classify the different aspects of physical and cognitive 'being' of an object. Then, how are they defined in phenomenology? For Husserl, the meaning of existence is diverse. Phenomenology explores how the realm of existence that is different from reality, such as consciousness, essence, and value, is constructed. The form of existence is also different. Choi (2008) explained that in the naturalistic understanding of being (existence), it is an alternative matter of "being or not being". However, in Husserl's phenomenology, existence has various aspects such as "certainly exists", "doubtfully exists", and "presumably exists". Therefore, it is necessary for us to analyze how these aspects of existence arise and how they relate to one another. Husserl often distinguishes things that are oriented toward objects or things in semantic, imaginary and perceptual ways. Thus, these modalities can be graded as a strict hierarchical order according to their ability to project us with the objects. Gallagher and Zahavi (2008) explained that the lowest and most empty way in which an object can be directed is signification. They further explained that these actions have referents, but their objects are not given in a fleshed-out manner. The act of imagination has some intuitive content, but like signification, it indirectly aims at an object. Only the actual perception directly brings us to the object. This is the only type of intentionality that gives us the object itself as a bodily presence or *propria persona*. Thus, according to the Husserlists, perception puts us in the face of the object, not in its picture, in its image, or in its textual information.

In Table 1, there are four cognitive levels according to different types of mediums for human cognition. The degree of self-identity is listed as 1) Physical object, 2) Virtual reality (VR), 3) Still image, and 4) Text. Lee (2017, 2019) did not classify the VR and still image in terms of senses as both have visual sense. However, adding different types of senses to VR would make it closer to the level of a physical object. In this context, the importance of auditory sense is further investigated.

2.1 PHENOMENOLOGICAL CONSIDERATION ON AUDITORY SENSE

Van Dyke (2014) explained that advocates of phenomenological approach in archaeology contend that phenomenological approaches help archaeologists to think about past peoples' meaningful, memory-laden, emotional, sensory, and metaphorical connections with their surroundings (p. 4). However, compared to the number of experimental research studies related to the topic, fewer theoretical studies were conducted on why the phenomenological approach would be important in archaeology or cultural heritage studies. In this section, the rationale on why auditory information is phenomenologically important is explained.

People may often experience that the world surrounding them is quite different when they listen to music as compared to when they do not. Well known phenomenologist, Merleau-Ponty explained this status in his book, *Phenomenology of Perception*, published in 1945. Cho (2004) introduced Merleau-Ponty's theory as follows:

When I close my eyes and enjoy the music in the concert hall and then wake up, the visual space seems narrower compared to the other space where the music just unfolded. Music is not actually contained in a precisely demarcated sparse visual space. Music draws in a new space where music ripples across the visual space (Cho 2004, 303).

There is a space where the music unfolds when you close your eyes and listen to music, there is a space that unfolds visually when you open your eyes, and there is a strange space where the musical space and the visual space overlap. Here, we can see that Merleau-Ponty refers to the spaces that unfold

separately according to these different individual senses, which he calls the diversity of space (Cho 2004, 304).

Ancient philosopher Aristoteles valued the importance of the sense of sight above any other senses. It would be true that we enjoy and value the visual sense relatively more compared with other human senses. Sheets and Mahoney (2022) indicates that archaeologists have relied almost exclusively upon sight among the five human senses to investigate architecture, features, and artifacts. However, they added, "In recent decades researchers have explored how ancient people may have experienced sound, because it was an essential component of lived experiences in ancient societies." (Sheets and Mahoney 2022, 1). According to Merleau-Ponty, music does not exist in the visual space as an additional sense. Instead, music penetrates, surrounds, and moves the visual space. Cho further explained that music and visual spaces could be distinguished only because they are based on the same world. The two spaces can enter competition with each other only because they equally claim a whole existence. The two spaces are united at the very moment they oppose each other (Cho 2004, 307). Thus, Merleau-Ponty's synthetic judgment is different from Husserl's, which may be called intellectual synthesis. Merleau-Ponty's synthetic judgment may be defined as practical synthesis, which is based on the human body. Thus, he emphasized that such a synthesis is not the result of intellectual action but is a real phenomenon, and the principal agent of the synthesis process is the human body. Husserl explained that the actual meaning of the sentence, 'I think', is in fact 'I think (something)'. That is because human consciousness is always the consciousness of (toward) something. This is called 'Intentionality' (Lee, 2014). For Merleau-Ponty, intentionality is 'the intentionality of the human body', not the one of intellectual reasoning. Lee (2019) explained that this type of intentionality was already discovered by Husserl as 'intentionality operant that works'. It refers to the intentionality that is passively operating at the fundamental level before the human intentionality works. 'Operating intentionality' is what unifies the world and our life in a natural and predicate way rather than in our objective perception,

which is more clearly revealed in the landscape we see. It is to provide the precise language we want the text to be translated into our perception (Lee 2019, 363).

Thus, a subject of perception is not a rational consciousness but the body in action. According to Kim (2014), in this case, the body is not an object that moves mechanically according to the command of the mind, but a 'phenomenal body (corps phenomenal)' that reveals at once the meaning of the world while sensually relating to the world. According to Merleau-Ponty, this phenomenal body is 'the third type that exists between a pure subject and an object' and becomes a central axis and a mediator which enables a subject to relate and act with the world. Varela, Rosch, and Thompson (1991) explained that Merleau-Ponty argued that the mind is embodied through the body, and perception is the primordial and fundamental relationship between man and the world. Therefore, all the senses we absorb through our body, not just vision, are all primary data for our perception of the world.

3 PHENOMENOLOGICAL CLASSIFICATION OF SONIC HERITAGE

We already reviewed why auditory information is important for human cognition as much as visual information. As Bartalucci and Luzzi indicated, "the peculiarity of the Soundscape approach is that it firstly relies upon human perception and then turns to physical assessment (2020, 1)". Therefore, understanding how people recognize the auditory information would be the foundation work for soundscape. We may apply the phenomenological classification of cultural heritage to the sonic heritage because what is embodied in our body through various senses may be incorporated into 'Positive Self-identity', which a person recognizes as an existing thing in the world. Therefore, the phenomenological classification of sonic heritage was developed (see Table 2). All the types of sonic heritage may be included in this classification.

Table 2: Phenomenological classification of sonic heritage

	Empirical Existence	• Original Sound	Non-empirical Existence
Positive Self-identity	Real sound		Mental model with intentionality

	Real sound	imaginary sound	<ul style="list-style-type: none"> Restored sound Text 	Imaginary mental model with intentionality
<ul style="list-style-type: none"> Sound Text 				<ul style="list-style-type: none"> Restored sound Text
1. Negative Self-identity	Unrecognized sound			Unrecognized mental model without intentionality
	Unrecognized imaginary sound			Unrecognized imaginary mental model without intentionality

In Table 2, 'Real sound' is the sound that exists in the physical world that people recognize such as the jazz songs recorded in 1950's for jazz fans. 'Unrecognized sound' is the sound that exists in the physical world that people do not recognize. Imagine someone who grew up in a society or at a time where he/she may not have experienced the 1950's jazz recordings or the restored ancient Greek pan flute song. Then, such sounds would be classified in 'Unrecognized sound' category. 'Mental model with intentionality' is the sound that does not exist in the physical world but which people recognize. An ancient Greek chorus, which we can listen to in a movie, may be an example in this category. We know there were many chorus songs played in the ancient Greek ceremonies, but due to the lack of scores or recordings, we do not know what kind of actual auditory information we could expect to experience. Finally, 'Unrecognized mental model without intentionality' is the sound that does not exist in the physical world, which people do not recognize such as the forgotten auditory information in an ancient document. In addition, the four categories in the imaginary category have the same logic except for the fact that auditory information is created by imagination. For example, 'Real imaginary sound' is the sound that people imagine that exists in the physical world that they recognize such as the sound of a dragon's cry.

Unlike Table 1, there are only two cognitive levels of different medium types for human cognition. The degree of self-identity is listed as 1) Sound and 2) Text. Like visual information, auditory information written in a textual document

is the lowest level of the self-identity. However, compared with visual information, it may not be apparent enough to distinguish the original sound from the restored one. For example, if we listen to the restored ancient Greek music played with ancient Greek instruments based on the original score, there may not be much difference from the original sound that we imagine. This would be the important point of why auditory information may play a significant role in terms of affecting human cognition of cultural heritage.

One of the values of this classification table lies in its flexibility of being applied to different people across time and place. There have been sets of criticism from a few scholars including Fleming (1999), and Hamilton and Whitehouse (2006). Especially, Hamilton and Whitehouse (2004) argued that phenomenological archaeology lacks replicability and methodological rigor, fails to contend with past/present environmental differences, ascribes a monolithic universality to bodily experience, fails to acknowledge that experience is culturally constructed, privileges the visual, and emphasizes description at the expense of power relations (Van Dyke 2014). Such critics may be relevant; we may never know nor realize 'the real past'. If we apply this topic to the phenomenological classification tables (Table 1 and 2), we may have to acknowledge that the 'real object' of the past would be different from the present 'real object'. Discussion on the most authentic real object would be another important philosophical topic that we may have to delve into. However, I believe that the real value of the phenomenological approach in cultural studies lies in its focus on the diversity of human perception. We may perceive differently when we see Big Ben in London or listen to Louis Armstrong's performances from those who lived in the 19th century or early 20th century. In the same context, Seoul citizens may perceive Big Ben or Louis Armstrong's performances differently from the London or Chicago citizens. However, the important point is that we should include all the different cognitive patterns, and then analyze and classify them. As Van Dyke (2014) mentioned, past landscapes may not exist any longer and contemporary landscapes may only provide us with partial, distorted experiences. However, we

may still analyze how we perceive contemporary landscapes and may try to find out how past people perceived the past landscapes.

Finally, in Table 1, it was explained that there are four cognitive levels of different types of visual medium in human cognition: real object, VR, still image, and text. However, unlike visual information, there seems no such apparent hierarchical level in the auditory information. For example, if you listen to the cannon sound, there is no clear difference in experience between listening to the same sound in a real castle or in a VR castle. In this context, we may argue that the sound could be a powerful and effective sense which revives the sense of the past in terms of experiencing cultural heritage. By utilizing the acoustic heritage in the VR field, we may minimize the gap between 'Empirical Existence' and 'Non-empirical Existence', and 'Positive Self-identity' and 'Negative Self-identity' in the phenomenological classification of cultural heritage (Table 1).

4 SYNERGIC EFFECTS OF VISUAL AND AUDITORY INFORMATION IN VIRTUAL REALITY

Rapid development of recent technology of Virtual Reality (VR) allowed people to experience a new world. Mittal defined VR as the interaction of humans with a simulated environment created using computing technology involving primarily computer graphics and artificial intelligence (Mittal, 2020). It creates a simulated environment in which a person can have similar experiences as those in the real world or completely different ones, depending on the purpose of that simulation (Călărașu and Iftene 2021, 1). Meanwhile, Walsh and Pawlowski (2002) defined three characteristics of VR as presence, interactivity, and immersion. Wohlgenannt, Simons, and Stieglitz (2020) explained that 'presence' is the feeling of being physically somewhere other than where one actually is, and 'interactivity' refers to the extent to which users can manipulate their virtual environment in real time. However, the concept of 'immersion' has not been agreed among researchers. Thus, VR leverages immersive technologies to simulate interactive virtual environment or virtual world with which users become subjectively involved in and in which they feel physically present (Wohlgenannt,

Simons, and Stieglitz 2020, 457). Experiencing VR may be different from experiencing the real world and understanding the experience of VR has been actively investigated in several experimental studies. For example, Serafin et al. (2016) introduced Virtual Reality Musical Instruments (VRMIs) that include a simulated visual component delivered via a head-mounted display or other forms of immersive visualization. Dükling et al. (2018) analyzed VR for athletes through a SWOT analysis and evaluated VR appropriate for certain types of sports. Zeng and Dong (2021) studied the artistic style conversion based on 5G VR and VR visual space. They analyzed the two concepts of VR technology and VR vision and led to the space art produced by the fusion of VR technology and VR vision to create an art space that gives people an immersive experience. Călărașu and Iftene (2021) introduced a new VR tool called, VR Fantasy Shooter, which is a virtual reality application developed for the standalone headset Oculus Quest which brings the PC games mechanics and possibilities in the virtual environment.

Meanwhile, Suárez, Alonso, and Sendra (2016) acknowledged that the application of VR technologies to cultural heritage has become a powerful tool for archaeological reconstruction. They tried to recover the acoustics of a famous extinct major religious space, the Maior Ecclesia in Cluny in France, such as the sound of a grandiose acoustic experience of Gregorian chant. Hence, there are many VR projects that we may apply in cultural heritage to provide a more vivid experience of the past for the users. It is not always necessary to apply both visual and auditory information in VR cultural heritages. However, there are some cases where visual and auditory information make a significant synergic effect. Till (2014) argued that if we combine contemporary visual modelling techniques with sound archaeology, the result may provide phenomenological multi-sensory immersive experiences which would allow one to explore an archaeological site by virtual immersion within it. He argued, "The key research questions to be addressed were to explore to what extent is it possible to confirm the existence of relationships between visual imagery and acoustic phenomena" (Till 2014, 7). We can find the visual information from the remaining tangible cultural heritage

including buildings, paintings, photos, sculptures, document records, and more. Meanwhile, it would be relatively not easy to find the auditorial information. Unless there are the remaining music recordings or scores, only resources we may depend on would be the documents.

4.1 SOUNDSCAPE STUDY ON JOSEON GARDEN

Samuels et al. (2010) introduced the scholarly trends that demonstrate recognition of the historical practices of legible aural inscription. Smith (1999) investigated what listeners would have heard within the wooden Globe theater in 1599 by detailed accounts of the acoustic properties of the place. Picker (2003) also searched for traces of the aural information in literatures of historical period such as Victorian Era. As a relatively recent study, Ha (2012) investigated what types of sound comprised the soundscape of 16th and 17th century gardens of the Joseon dynasty in Korea. By exploring a vast number of historical records, she found that there are several specific sounds that the high class of the Joseon dynasty enjoyed when they were in the gardens. She classified those sounds into two categories: "natural sound group" and "artificial sound group".

Figure 1: Scholar-gentry (Yangban) playing Geomungo in a garden (19th century).



The natural sounds are the sound of running water, waterfall, wind through pine trees or bamboos, rain falling on the lotus leaves, and the cry of orioles and geese. The artificial sound group includes the sound of musical instruments such as Geomungo (see Figure 1), Korean traditional flute, or a handbell sound used by Buddhist monks. She found that the auditory elements are important as much as the visual elements for the scholar-gentry class of the Joseon dynasty in order to fully appreciate the scenery of the garden.

Figure 2: Buyong-dong Garden established in 1637.



However, in many remaining traditional gardens, the auditory effects of the Joseon dynasty are not fully preserved. As for the soundscape of the Buyong-dong Garden (see Figure 2), which can be found in historical records, there were music and lyrics played in addition to the sound of water; however, they are currently lost. According to Ha (2012), currently the sounds that can be heard in the Buyong-dong Garden include the chirping of mountain birds, the sound of the wind blowing through the bamboo forest, and the sound of water flowing from the valley to the garden. However, there are also noises from the elementary school located next to the garden, and the sound of cars. Considering the realistic constraint, it would be difficult to solve such issues. Therefore, the role of sound effects in VR will become more important. For example, if we develop a VR for the Buyong-dong Garden, we may apply all the relevant sound effects that existed in the 16th and 17th Buyong-dong Garden excluding the noises from the current surroundings.

Not only the natural background sound but also the sound made by people can add characteristics according to the times. In addition to the 16th or 17th century sounds introduced above, there is an interesting unique sound that Paeok (패옥, 佩玉), a pendant of courtiers' robes (see Figure 3), makes that may not only define the identity of the scholar-gentry class of the Joseon dynasty but also may add a taste to the art.

Figure 3: Paeok (Joseon dynasty).



Historical documents show that many scholar-gentry class men carried Paeok and they intentionally made clicking sounds to boast themselves. For example, in the book of Seoae literature written by Ryu Seong-Ryong (1542-1607), there is a poem as follows:

*It was a very good day
A lot of great seniors gather
Paeok resounding loudly
O God, please come to me
Surely take this cup*

This poem describes the social gathering of scholar-gentry class men in the 16th century Joseon dynasty. We can find that there were the loud sounds of Paeok because of the gathering. If we add this auditory effect to the person who is walking in the virtually constructed 17th century Joseon's garden with all the sounds mentioned above, it may provide just as much of a lively and vivid experience as the 17th century scholar-gentry class men enjoying the garden. It is the goal of the future VR experience to become as similar as an actual real-life experience. To actualize this goal, we need not only visual information but also other human senses such as auditory or haptic information. Theoretical importance of sonic heritage lies in this point. As Till (2014) explained, sound has an important role to play, to animate, and to bring alive what could otherwise be a rather static and lifeless space because sound is a sensation, and belongs to

the realm of activity rather than artefact. Experiencing the auditory aspect of cultural heritage is not only additional but equally important as visual elements. Finally, by using both types of information in VR, we may expect more effective results to transform the cultural heritages that are categorized in 'Non-empirical Existence' or 'Negative Self-identity' to the ones in 'Empirical Existence' or 'Positive Self-identity' in the phenomenological classification of cultural heritage.

5 CONCLUSION

We discussed the philosophical importance of the auditory information in sonic heritage from the phenomenological point of view. We developed the phenomenological classification for sonic heritage and reviewed the role of VR as well. Human cognition includes both physical and virtual experiences, and the aspects or patterns of reacting to visual and auditory information may be different. It may be different from the ones of experiencing both mediums at the same time. In this context, understanding people's cognitive experiences between tangible and intangible heritage would be important. Therefore, further research may seek to identify differences between the experiences of participants exploring those different mediums. We may also investigate the degree of importance of five human senses: touch, sight, hearing, smell, and taste to develop more effective VR. We may even extend our studies to find out which combination among the five senses to be most effective depending on the different cultural heritage VR. For example, if we pursue a VR for a cultural heritage museum, 'sight and touch' combination might be more significant. One of the challenges in preserving or restoring sonic heritage would be the consistency of methodology in assessing the sounds. As we reviewed, there have been a considerable number of soundscape or sonic heritage projects in different locations. However, there is still no solid methodology which may guarantee the credible quality of the product among the projects. Aletta and Kang also indicated, "For the measurements, the researchers' work should always be commended, for the considerable challenges they face in implementing standardized measurement protocols in locations that often present serious accessibility and operability issues." (2020, 129). It may be

one of the agendas for researchers to discuss and build a unified methodology or technology.

Samuels et al. indicated that scholars have long suggested that one of the difficulties posed by sounds, as compared with images, is the inability to extract sounds from their temporal constraints. We can see the material remains of Pompeii and describe with some accuracy their architecture, spatial and material properties; but we can only imagine, infer, or at best indirectly reconstruct what they sounded like (2010, 338). Ironically, such scarcity value may be why preservation or restoration of sonic heritage as intangible heritage is receiving attention with the rapid progress of audio technology. In addition, because of its scarcity in terms of their remains as compared with visual heritage, the role of VR for sonic heritage could become more significant. As Merleau-Ponty said, there is a strange space where the musical space and the visual space overlap. The impact of creating such a space would be significant in the VR space as much as in the real world.

REFERENCES

Aletta, F. & Kang J. (2020). Historical Acoustics: Relationships between People and Sound over Time. *Acoustics*, 2(1), p. 128-130.
<https://doi.org/10.3390/acoustics2010009>

Allen, C. (2017). On (not) defining cognition. *Synthese*, 194 (11);, 194 (11), p. 4233-4249.

Bartalucci, C. & Luzzi S. (2020). The Soundscape in Cultural Heritage. *The IOP Conference Series: Materials Science and Engineering*, Vol. 949. *International Conference Florence Heri-tech: the Future of Heritage Science and Technologies*, Florence, France. Online edition.
<https://iopscience.iop.org/article/10.1088/1757-899X/949/1/012050/meta>

Bayne, Tim., Brainard, D., Byrne, R. W., Chittka, L., Clayton, N., Heyes, C., Mather, J., Ölveczky, B., Shadlen, M., Suddendorf, T., & Webb, B. (2019). What is cognition? *Current Biology* 29(13), p.608-615.

Bennett, A. (2009). Heritage rock: Rock music, representation and heritage discourse. *Poetics*, 37(5-6), p. 474-489.
<https://doi.org/10.1016/j.poetic.2009.09.006>.

Borowiecki, K. J., Forbes, N., & Fresa, A (eds.) (2016). *Cultural Heritage in a Changing World*. New York, NY: Springer International Publishing.

Călărașu, T. C. & Iftene, A. (2021). Virtual reality FantasyShooter. In *Proceedings of the workshop on Intelligent Information Systems WIIS2021*, Chisinau, Republic of Moldova, Oct. 14-15, 2021. (pp.143-155). ISBN 978-9975-68-415-6.

Cho, G. J. (2004). *The world of the body, the body of the world: An exposition of Merleau-Ponty's Phenomena of Perception*. Seoul, Republic of Korea: Ehaksa.

Choi, I. M. (2008). Phenomenology of being and Husserl- Focused on the issue of independence of orientation towards being. *Philosophical Forum*, 36, p.159-190.

Djimantoro, M. I. & Sakina, B. (2021). A Portrait of Residential Soundscape in Several Indonesian Cities. *IOP Conference Series: Earth and Environmental Science*, Vol. 794, *The 4th International Conference on Eco Engineering Development*, Jakarta, Indonesia. Online edition.
<https://iopscience.iop.org/article/10.1088/1755-1315/794/1/012198/meta>

Düking, P., Holmberg H-C., & Sperlich, B. (2018). The potential usefulness of virtual reality systems for athletes: a short SWOT analysis. *Frontier in Physiology*, 9, p.128. <https://www.frontiersin.org/articles/10.3389/fphys.2018.00128/full>

Ferrarini, L. & Scaldaferrri, N. (2020). *Sonic Ethnography: Identity, Heritage and Creative Research Practice in Basilicata, Southern Italy (Anthropology, Creative Practice and Ethnography)*. Manchester, England: Manchester University Press.

Fleming, A. (1999). Phenomenology and the megaliths of Wales: a dreaming too far?" *Oxford Journal of Archaeology*, 18(2), p.119-25.

Gallagher, S. & Zahavi, D. (2008). *The Phenomenological Mind: An Introduction to Philosophy of Mind and Cognitive Science*. New York, NY: Routledge.

Goodwin, G. & Richards-Rissetto, H. (2017). Modelling acoustics in ancient Maya cities: Moving towards synesthetic experience using GIS & 3D simulation. In *Proceedings of the 45th Conference on Computer Applications and Quantitative Methods in Archaeology, Atlanta, U.S.A, 2017*. (pp.73-86). Tubingen University Press: Tuebingen, Germany.

Ha, I-Y. (2012). *Study on the Soundscape during 16,17th Century in Joseon Period: focused on the Meaning of Sound and Techniques*. [Master's thesis, Seoul University].

Hamilton, S. & Whitehouse, R. (2006). Phenomenology in practice: towards a methodology for a "subjective" approach. *European Journal of Archaeology*, 9(1), p. 31-71.

Hassan, S. A. & Taha, H. S. (2020). The role of the urban soundscape in identification of Baghdad traditional city. *IOP Conference Series: Materials Science and Engineering*, Vol. 1105. *The Fifth Scientific Conference for Engineering and Postgraduate Research (PEC 2020)*, Baghdad, Iraq. Online edition.
DOI:10.1088/1757-899X/1105/1/012113.

Kim, H. J. (2014). Maurice Merleau-Ponty. In *Phenomenology of the Interworld*, edited by Choi, Jae Sik, et al., eds., *The great age of French philosophy*. Seoul, Republic of Korea: Minumsa-Banbi.

Lee, H. J. (2017). Phenomenological classification of cultural heritage: role of virtual reality. *Virtual Archaeology Review*, 8(16), p. 69-74.

Lee, H. J. (2019). The impact of visual media on social cognitive concept: The case of cultural object Ru. *Virtual Archaeology Review*, 10(21), p. 80-89.

Lee, N. I. (2014). *Husserl and Merleau-Ponty, The Phenomenology of Perception*. Paju-si, Gyeonggi-do, Republic of Korea: Hangilsa.

Mittal, H. (2020). Virtual Reality: an overview. *CSI Communications* 44(4), p. 9-10.

Murphy, D, Shelley, S., Foteinou, A., Brereton, J., & Daffern, H. (2017). Acoustic Heritage and Audio Creativity: the Creative Application of Sound in the Representation, Understanding and Experience of Past Environments. *Digital Creativity in Archaeology*, 44. <https://intarch.ac.uk/journal/issue44/12/toc.html>.

Picker, J. M. (2003). *Victorian Soundscapes*. New York, NY: Oxford University Press.

Primeau, K. E. & Witt, D. E. (2017). *Soundscapes in the past: Adding a new dimension to our archaeological picture of ancient cultures*. Last modified August 2, 2017. <https://theconversation.com/soundscapes-in-the-past-adding-a-new-dimension-to-our-archaeological-picture-of-ancient-cultures-80861>

Rancier, I. *Understanding Intangible Cultural Heritage*. Last modified October 10, 2019. <https://en.ccunesco.ca/blog/2019/10/understanding-intangible-cultural-heritage>

Samuels, D. W., Meintjes, L., Ochoa, A. M., & Porcello, T. (2010). Soundscapes: Toward a Sounded Anthropology. *Annual Review of Anthropology*, 39 (1), p. 329-345.

Serafin, S., Erkut, C., Kojs, J., Nilsson, N. C., & Nordahl, R. (2016). Virtual reality musical instruments: state of the art, design principles, and future directions. *Computer Music Journal*, 40(3), p. 22-40. https://doi.org/10.1162/COMJ_a_00372

Sheets, P. & Mahoney, R. (2022). "The Soundscape in the Replica of the Ceren Temazcal." *Ancient Mesoamerica*, 33(1), p. 36-50. DOI:10.1017/S0956536120000383

Smith, B. R. (1999). *The Acoustic World of Early Modern England: Attending to the O-Factor*. Chicago, IL: The University of Chicago Press.

Suárez, R., Alonso, A., & Sendra, J. J. (2016). Archaeoacoustics of intangible cultural heritage: The sound of the Maior Ecclesia of Cluny. *Journal of Cultural Heritage*, 19, p. 567-572. <http://doi.org/10.1016/j.culher.2015.12.003>.

Till, R. (2014). Sound archaeology: terminology, Palaeolithic cave art and the soundscape. *World Archaeology*, 46(3), p. 292-304.

Tomasello, M., & Rakoczy, H. (2003). What makes human cognition unique? From individual to shared to collective intentionality. *Mind and Language*, 18(2), p. 121-147.

Hoeven, A. V. D. (2014). *Popular music memories. Places and practices of popular music heritage, memory and cultural identity*. [Doctoral dissertation, Erasmus University]. ISBN: 978-90-76665-26-9.

Van Dyke, R. M. (2014). Phenomenology in Archaeology. In Claire, Smith, et al. eds., *Encyclopedia of Global Archaeology*. New York, NY: Springer.

Varela, F. J., Rosch, E., & Thompson, E. T. (1991). *The Embodied Mind: Cognitive Science and Human Experience*. Cambridge, MA: MIT Press.

Walsh, K. R. & Pawlowski, S. D. (2002). Virtual reality: A technology in need of IS research. *Communications of the Association for Information Systems*, 8(1), p. 297-313.

Wohlgenannt, I., Simons, A. & Stieglitz, S. (2020). Virtual Reality. *Business & Information Systems Engineering*, 62(5), p. 455-461.
DOI: 10.1007/s12599-020-00658-9

Yelmi, P, Kuscu, H., & Yantac, A. E. (2016). Towards a sustainable crowdsourced sound heritage archive by public participation: The Soundsslike project. In *Proceedings of the 9th Nordic Conference on Human-Computer Interaction (NordiCHI)- Game Changing Design, Gothenburg, Sweden, 2016*. (pp. 1-9). New York, NY: The Association for Computing Machinery.

Zeng, L. & Dong, X. (2021). Artistic style conversion based on 5G virtual reality and virtual reality visual space. *Mobile Information Systems*, vol 2021, 8 pages.
DOI: <https://doi.org/10.1155/2021/9312425>