Linguistic Frontiers • 8(2) • 2025
DOI: 10.2478/lf-2025-0012

Linguistic **Frontiers**

Resonating with the Past: Mediation of Memory in Sound Sculptures

Original Study

Mariia Korniietska
University of Tartu
Department of Semiotics
mariak0140@gmail.com

Received: 31 December 2024; Accepted: 15 July 2025

Abstract. Sound sculptures can serve as resonant mediums of remembrance, reawakening historical soundscapes and evoking memories through the use of sound. In this way, they enable a sensory connection to the past. This paper explores how sound functions as a semiotic resource, interacting with other modalities within sound sculptures and the contexts in which they are placed. It examines how memory can be accessed through the sense of hearing and investigates cases where sound memorializes historical events.

I draw on a social semiotic approach, particularly Günter Kress's theory of multimodality, considering sound sculptures as multimodal texts and multisensory objects. Complementing this, I employ sound theory and acoustic ecology studies, primarily the works of Raymond Murray Schafer, which provide a language for describing the sound modality within sound sculptures.

To ground this exploration, I analyze sonic objects and sonic events in the sound sculptures by artists Bill Fontana, Markus Kison, and Nikita Kadan through the lenses of the acoustic ecology framework. These works exemplify how sound can operate as both a symbol and a mnemonic trigger, how its sensory and emotional dimensions contribute to memory-making processes.

Keywords: sound, sound sculpture, hearing, memory, multimodality

INTRODUCTION

As forms of sound art, sound sculptures can incorporate various kinds of auditory signs, sound-generating technologies, or acoustic phenomena. More interesting—and less researched—is their potential to act as mediums of memory, where sound, as the dominant modality, reactivates the past through the recreation of elements of historical soundscapes. In this way, I explore the sonic mediation of memory, particularly considering sound sculptures that use auditory symbols and engage audiences in the process of collective listening. I analyze examples of sound sculptures that activate memories in public spaces, focusing on their sound objects and sound events. Before turning to these cases, I will first discuss the art form of sound sculpture and the modality of sound in relation to memory and history.

Sound sculptures in this text are considered multimedia art forms that evolve in space and time, with sound playing the primary role. This definition is coined in response to the long and ambiguous history of the concept and genre throughout the 20th century. Although the term "sound sculpture" gained prominence in the 1970s—popularized by American composer Bill Fontana—its artistic lineage can be traced back to early avant-garde

movements, when Marcel Duchamp proposed the concept of sculpture musicale, describing "sounds lasting and leaving from different places and forming a sounding sculpture that lasts" (quoted in Fujak 2022, 71). According to Július Fujak, Duchamp's idea—alongside John Cage's piece 4'33" (1952)—later redirected attention to "deep listening in unique environments", shifting music toward spatial and environmental listening (Fujak 2022, 71–72). Additionally, Brendon LaBelle conceptualizes Cage's influence as "the increasing move from object to events" (LaBelle, 2006, 52). Thus, in the 1960s and 1970s, influenced by Duchamp's and Cage's conceptual legacy, artists began focusing more on the processes of hearing, listeners' perspectives, and the specificities of sound perception in various spaces and environments. The development of recorded sound, sound transmission, and field recording technologies accompanied this shift. This led to the creation of the novel forms in sound art—sound installation and sound sculpture.

Helga de la Motte-Haber proposes a clear distinction between sound sculptures and sound installations.

> Single sounding objects that offer the viewer a visible material opponent can be referred to as sound sculptures. Sound sculptures can be hung in different spaces, meaning they are not necessarily dependent on a site. In contrast, the sound installation is site-specific… Hybrids of sound installations and sound sculptures are installations in which a number of sound sculptures or objects are combined and installed in one place. (de la Motte-Haber 1999, 95)

Ros Bandt emphasizes the interdisciplinary hybridity of sound installations and sound sculptures as well, highlighting that these works often combine parameters derived from sculpture, sound, architecture, temporal composition, and interactivity (Bandt 2006, 353). Many projects merge diverse elements such as sculptural forms, video, performance, sound, while others may be almost invisible. Bill Fontana's practice exemplifies this fluidity; since 1976, he has defined his works as sound sculptures. His real-time listening networks foreground ambient, spatially distributed sound and have been presented in a variety of settings, documented in his official archives.

Given this overlap, the distinction between sound installation and sound sculpture is often fluid and hybrid. In this paper, I choose to employ the term sound sculpture to maintain conceptual flexibility, particularly as the three case studies discussed here were presented as separate sound projects within museum settings after appearing as site-specific installations. This choice reflects the ability of artistic projects to overcome site specificity, allowing for multiple editions and the incorporation of new elements, objects, and media within their forms.

THE CONCEPT OF SOUND

Understanding sound sculptures as multimodal art forms requires a brief outline of key conceptual approaches to sound itself. Steven Feld's socio-cultural approach views sound as a "total social fact" that embodies cultural identity, community, and collective experience. Feld emphasizes sound's role in expressing cultural values and connecting individuals to their social environments (Feld 1996, 91). Raymond Murray Schafer, a key figure in acoustic ecology, defines sound as fundamental to the "soundscape" that shapes our perception of place and environment. Schafer's view situates sound as both reflective and constitutive of surroundings, influencing how we perceive and interact with our environment (Schafer 1994, 7). Both the socio-cultural and acoustic ecology frameworks emphasize the importance of the environment in which sound resonates, but also the role of sound as a mediator between personal and public, individual and collective.

From a semiotic perspective, Roland Barthes conceptualizes sound as a "signifying system" that conveys symbolic meanings, enriching communication through complex, layered interpretations (Barthes 1977, 179). Finally, Brandon LaBelle frames sound as a spatial medium that "defines space" through movement and immersion, positioning it as a relational force within its environment (LaBelle 2006, 133).

From an artistic point of view, in the musique concrète tradition, Pierre Schaeffer introduces the concept of sound as an "objet sonore", or "sound object", which emphasizes its perceptual qualities independently of its source. Schaeffer's approach encourages a deeper analytical focus on sound's abstract properties—such as texture, pitch, and rhythm—promoting a sensory engagement with sound itself (Schaeffer 1966, 76). This approach focuses on the sense of hearing and the possibilities of the human ear to distinguish sounds. The perspective of the listener is also emphasized by Michel Chion's notion of sound as an "acousmatic experience"—hearing sound without its visible source—which highlights sound's interpretative and emotional impact, particularly in audiovisual contexts (Chion 1994, 25).

This groundwork sets the stage for applying a social semiotic approach to sound sculptures, examining sound as a communicative and multimodal resource that creates sensory, spatial, and interpretative experiences in public and commemorative spaces.

SOCIAL SEMIOTIC APPROACH TO SOUND

In the framework of multimodality, sound occupies a unique position as a mode of meaning-making, shaped not only by its physical properties but also by the cultural practices and social conventions that frame its use. According to Kress, a mode is a "socially shaped and culturally given semiotic resource for making meaning" (Kress 2010,79). This means that sound, much like other modes such as image or writing, derives its capacity to convey meaning from both its material characteristics and the ways in which societies use it for communication. In contemporary digital culture, we are immersed in a dense media environment saturated with both visual and sonic stimuli. Sound is often overused, misused, or

reduced to background or intrusive noises. In this climate of sensory overload, both sound and image risk losing their communicative power. This invites a renewed search for intentional, meaningful uses of sound modality—uses that engage listeners through attention, embodiment, and interpretation.

Kress emphasizes that different modes offer distinct potentials for making meaning, and these potentials affect the choices made in specific communication contexts. In the case of sound, "material" properties such as *variations in pitch*, *loudness*, *rhythm*, and the use of *silence* provide a wide array of resources for meaning-making. These material affordances are experienced through hearing, a physiological process that interacts with sound's temporal nature. Unlike visual modes, which rely on the spatial arrangement of elements, sound unfolds in time. Sound can be shaped into various sub-modes, such as *speech*, *music*, or *soundtracks*, each utilizing different affordances of sound as a material (Kress 2010, 80). For example, pitch variations in speech can generate intonation patterns that alter the meaning of sentences, while rhythm and pauses contribute to the structure and emphasis of spoken language. Similarly, music employs pitch, rhythm, and dynamics to evoke emotional responses and create meaning, while soundscapes in film might use background sound to set a mood or convey implicit information.

In recent times, the increasing emphasis on visual culture, especially in digital media, has marginalized sound in public communication. The predominance of image-based communication raises an essential question: why is sound important, and why should it be reintroduced in public spaces? To address this, it is necessary to consider how sound functions in human experience and communication. Unlike images, sound operates under the "logic of sequence in time" (Kress 2010, 81), requiring the listener to engage with it over time. This temporal dimension makes sound a particularly immersive and embodied mode of communication. Furthermore, sound has the potential to deepen connections to the environment. In public spaces, for instance, sound sculptures can serve as reminders of lost historical and natural soundscapes. By harnessing the affordances of sound as a mode, sound sculptures can evoke memories, emotions, and a sense of place that visual modes may not replicate.

Kress's assertion that "modes differ in what they offer from culture to culture" (Kress 2010, 82) is particularly relevant here. The social and cultural shaping of sound as a mode means that different societies and communities use sound in diverse ways to fulfill their communicative needs. "Societies and their cultures select 'materials'—sound, clay, movement (of parts) of the body, surfaces, wood, stone—which seem useful or necessary for meaning-work in that culture to be done" (Kress 2010, 82). For some cultures, remembrance dynamics may be better represented through sound modes (music, songs, or recorded soundscapes) if they more effectively address the cultural need to create meaning through emotional resonance.

Sound as a mode is inherently multimodal, often interacting with other modes, such as visual or spatial elements, in complex ways, which raises another important point for consideration. In sound sculptures, this multimodality is particularly evident, as sound does not exist in isolation but is embedded in a broader semiotic system that includes the physical environment, the movement of people, and the interaction between sound and space. As Joaquim Braga suggests, "sound, combined with other modalities, can develop relations while, at the same time preserving its modal entity", allowing it to "articulate distinct sensuous data" (Braga 2019, 132). This aligns well with the dominant role of sound in sound sculpture as a sonic artwork. In this sense, sound and other modes perform representational, interactive, and compositional functions to form multimodal texts (Kress 1996, 43).

Braga also introduces the concept of "implicit multimodality", emphasizing that sound, although primarily perceived through hearing, engages other senses as well. He notes that "the sense of hearing is not the only perceptual sound channel" (Braga 2019, 133), highlighting the intricate nature of sound's interaction with other sensory experiences. This aligns with the immersive quality that sound sculptures can create in space, offering a rich and layered sensory experience that transcends the auditory dimension alone.

Thus, sound sculptures can be seen as multimodal texts, where sound interacts with physical objects, spaces, and often with visual and tactile elements, but still preserving its entity and playing a dominant role. Kress's model of multimodality aligns with the complexity of sound sculptures, where sound functions both as a material and semiotic resource. By engaging with the material affordances of sound—its volume, pitch, rhythm, and duration—sound sculptures challenge the prevailing dominance of visual modes and offer a sensory alternative that emphasizes the importance of hearing in human experience. These art forms can represent a turn toward sonic experiences (and sensory experiences in general) as a way of creating meaning. Often, placed in contemporary public spaces, sound sculptures serve as an example of how the mode of sound can be re-engaged and reinterpreted in meaning-making processes.

HISTORICAL SOUNDSCAPES AND THE SENSE OF HEARING

The exceptional role of the senses, particularly hearing, in shaping our understanding of history and memory is increasingly acknowledged in contemporary historical studies. By approaching past events through sensory experiences, we gain new ways of understanding identities, spaces, and cultural dynamics. This approach not only aims to reconstruct historical settings but also unveil previously undiscovered experiences of the past. Additionally, it underscores the significance of memory

and emotion in shaping historical narratives. "This has been informed by a heightened awareness of the role that the senses play in shaping modern identity and understanding of place, … and increasingly, how the senses are central to the memory of past experiences and their representation" (Damousi, Hamilton 2017, 1).

The sensory turn in historical studies does more than just recreation of historical landscapes. The sensory approach lets one explore different aspects of the past that have previously gone unrecorded. This methodological shift helps us understand "subliminal histories"—aspects of the past that have always been present but are now being interpreted differently. "When we think about the senses, we are exposed to [we uncover] 'subliminal histories' that may have always been there, but we are now choosing a different path for understanding their meaning" (Damousi, Hamilton 2017, 2).

Hearing, as a vital sense for the perception of sound, not only serves a biological function but also holds profound semiotic and relational significance. Raymond Murray Schafer's idea that hearing can be described as "a way of touching at a distance" (Schafer 1994[1977], 11) underscores the tactile nature of sound, showing how it bridges the gap between the individual and their environment.

Sound's dual role—both deeply personal and inherently social—creates a certain dynamic in collective auditory practices. Even in group settings, such as concerts or communal soundscapes, sound maintains a sense of intimacy. Schafer's notion that "the intimacy of the first sense is fused with sociability whenever people gather together to hear something special" (Schafer 1994[1977], 11) can be interpreted as a capacity of the sound to enable to share experience while still engage individuals on an intimate level. It lets us see that those auditory experiences, whether solitary or communal, are rooted in personal perception, forging connections that transcend the visual and tactile, blending the personal with the collective in a seamless act of auditory participation.

While sound studies have emerged as a major academic field, much of this material remains ahistorical or focused on technological advances. There is also limited work on memory and the senses, beyond their role as "mnemonic triggers" (Damousi, Hamilton 2017, 2). This gap may exist because it involves the physiological basis of cultural effects. Treating the senses merely as cultural phenomena ignores the crucial role of memory and emotion in their articulation. Sound, like vision, responds to external stimuli and has been separated by recording technologies. "While sound studies in particular has emerged as a major academic field in recent times, much of this material remains ahistorical or focused on technological advances of sound" (Damousi, Hamilton 2017, 2).

In studies of historical soundscapes, the concept of "earwitnessing" presents another challenge, particularly when considered alongside the ahistorical nature of data and the emphasis on technological aspects of sound. Using Schafer's definition of soundscape—"any acoustic field of study we may speak of a musical composition as a soundscape, or a radio program as a soundscape, or an acoustic environment as a soundscape" (Schafer 1994[1977], 7)—this research considers mostly the representations of the sound environments of the past as they are perceived by modern humans.

While earwitness accounts provide historians with a means to access periods predating the advent of recording technologies, allowing an engagement with past soundscapes through written records, they do offer a historical foundation. As Schafer notes, "we may utilize the techniques of modern recording and analysis to study contemporary soundscapes, but for the foundation of historical perspectives, we will have to turn to earwitness accounts from literature and mythology, as well as to anthropological and historical records" (Schafer 1994[1977], 8).

However, the inherent limitations of language make it possible to describe the common qualities of sound logically, though not always capturing the emotional resonance. As such, examining the sensory dimensions of the past, through both material culture and memory, deepens our understanding of historical experiences and the resources available for interpreting sensory histories.

In this sense, the question of sources for not just logical understanding (from the written word) but also experiencing, hearing and resonating with the soundscapes of the past remains open. This highlights the challenge of fully capturing the emotional and sensory depth of historical sounds. As Damousi and Hamilton emphasize, we need to explore how the senses "…illuminate the historical and what sources are available to read the senses of the past through the material and memory" (Damousi, Hamilton 2017,5). This broader sensory approach underscores the importance of using material culture and memory as critical resources for accessing and interpreting the sensory experiences of the past.

Another problem of approaching historical soundscapes lies in creation of situations of sonic experiences, finding the ways of representing the sounds of the past, especially in public spaces. One of the possible ways that can be regarded is the creation of aural augmented realities. Aural Augmented Realities (AAR) show how lost soundscapes can be reconstructed and what kind of impact they can have on a visitor's connection to the past. "Hearing past soundscapes can provide whole new ways of experiencing, understanding, and feeling history" (Graham, Shawn, et al. 2019, 224).

Fighting the assumption that sight is the most important sense for understanding the world, auditory experiences can offer a more affective and immersive method of connecting with history. As cognitive and perceptual research shows, the use of sound (through spoken word, natural soundscapes, or spatialized audio) can help to engage people more deeply in historical narratives.

> We assume that the senses neatly cleave, allowing us to prioritize one sense over another. With our contem-

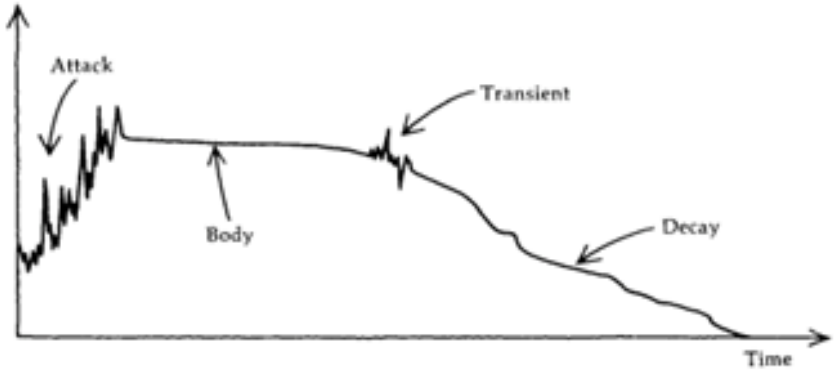

Figure 1: Graphic depiction of the components of the sound object, its "envelope"
From The Soundscape: Our Sonic Environment and the Tuning of the World (p. 130), by R.M. Schafer, 1994, Destiny Books. Copyright 1994 by R. Murray Schafer.

> porary focus on the visual, we tend to prioritize sight over other senses, but in this chapter, we suggest that 'hearing' the past is a more effective and affective way of providing immersive AR. (Graham, Shawn, et al. 2019, 224–225)

The key element here is a certain feeling of immersion in a space, which is created through relationships between humans and their environments. When these relationships are disrupted, immersion can be lost. Since hearing relies on attentiveness, audio AR has a unique capacity to sustain what Turner refers to as "affective" and "cognitive/perceptual" intentionality. Ultimately, the past can often be "heard" more readily than it can be "seen" (Graham, Shawn, et al. 2019, 225).

However, the mediation of memory and historical soundscapes can take place not just by the means of AAR, but also through contemporary art and public art practices, especially through the sound art and the sound sculptures.

SOUND OBJECT, SOUND EVENT, SOUNDSCAPE

Sonic experience can be analyzed using key concepts from acoustic studies: the sound object, sound event, and soundscape. These terms allow for an examination of sound in sound sculptures as distinct sonic units (*sound object*), contextual occurrences and symbols (*sound event*), and integral elements of a broader acoustic environment (*soundscape*).

The *sound object* ("l'objet sonore"), a term introduced by Pierre Schaeffer, is defined as "an object for human perception and not as a mathematical or electro-acoustical object for synthesis" (Schaeffer 1966, 77). Raymond Murray Schafer further describes it as "the smallest self-contained particle of a soundscape" (Schafer 1994[1977], 129), analyzable through its "envelope", which consists of three main components: *attack, body,* and *decay*.

- *Attack*: This is the onset of the sound object, where the sound begins and briefly creates a noisy, enriched spectrum. A rapid attack adds sharpness, while a slower one produces a smoother quality. The attack is critical for sound identity, as its absence can make sounds unrecognizable.
- *Body*: The body is the relatively stable phase of a sound object, though it is never entirely stationary. Some sounds (e.g., bells, gongs) lack a body, while others (e.g., air conditioners) consist predominantly of this phase, contributing to their prolonged presence.
- *Decay*: This is the final phase, where the sound weakens and fades into ambient noise. Decay often includes reverberation, blending reflections into an indistinct persistence, in contrast to the clear repetition of echoes. (Schafer 1994[1977], 129-131)

While these components can be separated for analysis, Schaeffer insists on the holistic perception of the sound object, independent of its source. This framework offers a foundation for understanding sound in monuments, replacing visual categories with auditory-focused tools.

This acoustic approach has notable strengths. It allows sound components to be identified and analyzed by the human ear, using descriptive, graphic language rather than musical notation. However, such graphic representations are typically produced under controlled laboratory conditions, where sounds are isolated from the complex interplay of other auditory elements present in real-world environments.

This limitation led to the introduction of another concept: the *sound event.* Schafer defines sound events as individual sounds whose associative meanings are examined within their context, distinguishing them from sound objects, which are studied as isolated entities in a controlled setting. He explains: "When we focus on individual sounds to explore their associative meanings as signals, symbols, keynotes, or soundmarks, I propose to call them sound events, to avoid confusion with sound objects, which are laboratory specimens" (Schafer 1994[1977], 131).

As sound events, sounds will be analyzed considering their capacity to evoke narratives, reference specific environments, or function as cultural and historical markers. Schafer suggests the concept of "keynote" sounds that means the "background sounds" of a particular environment, which are heard continuously or frequently enough to establish the tone or character of a place. They often go unnoticed by the conscious ear, appearing just as the sonic foundation for other sounds. The possible examples are the sounds of ocean waves in a coastal town or the sounds of traffic in a busy urban center. "Keynote sounds are those which are heard by a particular society continuously or frequently enough to form a background against which other sounds are perceived" (Schafer 1994[1977], 272).

At the same time, Schafer introduces the term "soundmark" as an auditory equivalent to a landmark. A soundmark is a unique sound in a community or environment that holds special significance to its inhabitants and contributes to their identity. The sound of a historic clock tower in a city or the church bells of a local cathedral can be considered soundmarks. "A soundmark is a community sound which is unique or possesses qualities which make it specially regarded or noticed by the people in that community" (Schafer 1994[1977], 274).

The *soundscape*, therefore, becomes a field of interactions where sound events are not merely isolated components but part of a larger auditory environment. Understanding how sounds interact with and transform one another—and influence human perception—within their natural contexts presents a far greater challenge than analyzing individual sounds in isolation. Yet, it is precisely this interplay that offers cases for soundscape researchers to explore.

In the following section, these concepts will be applied to three cases of sound sculptures and the processes of reawakening the historical past through the use of sound.

MEDIATION OF MEMORY IN SOUND SCULPTURES

Selected examples of sound sculptures commemorate events that are already viewed as historical, rather than addressing more recent events. They can even be addressed as sound monuments. This focus on historical events allows me to explore how sound can function as a medium of remembrance for past tragedies or milestones, without the immediacy or political tension that often accompanies more contemporary commemorations.

Additionally, I chose minimalistic works where the physical setting is intentionally subdued or stripped down. In these cases, the absence of elaborate or overwhelming visual elements enables the sound itself to occupy a more prominent role. By removing distractions and limiting the physical context, these works emphasize the significance of sound and its ability to convey meaning on its own, allowing the sound to shape the experience and understanding of the commemorated event in a more direct and contemplative manner.

I will contextualize and discuss three sound sculptures: *Distant Trains* (1984) by American artist Bill Fontana, *Touched Echo* (2007) by German artist Markus Kison, and *The Inhabitants of Colosseum* (2018) by Ukrainian artist Nikita Kadan. A unifying aspect of these works is their geographical placement—all were situated within German cities (Berlin, Dresden, and Regensburg, respectively). Additionally, each of these projects reflects on memories of World War II (1939–1945), engaging with themes of destruction, trauma, and loss, and addressing the impact of emotionally charged and traumatic historical events.

What further unites these works is that each was a public intervention, existing only temporarily in the urban landscape. Sound was used as a medium to reactivate memories embedded in specific city locations, imbuing these spaces with new layers of meaning. *Distant Trains* was created at the ruins of Anhalter Bahnhof in Berlin; *Touched Echo* was installed on Brühl's Terrace in Dresden; and *The Inhabitants of Colosseum* tells the tragic story of the guesthouse "Colosseum" in the Stadtamhof district in Regensburg.

This auditory reawakening of memory within the cityscape brought historical narratives into dialogue with the present, transforming how contemporary audiences experienced these spaces. By drawing on collective memories and presenting them publicly, these sound sculptures created a situation of a meaningful engagement with the historical past in the heart of public urban environments.

Another important aspect I want to highlight is the complexity of the German culture of remembrance, particularly in relation to sound artworks that address World War II events. In this context, these works are not only engaged with the legacy of the Holocaust but are also placed in dialogue with the issue of collective German guilt for the atrocities committed by the Nazis. This cultural dialogue is especially relevant in works that address the destruction within Germany itself and the crimes committed by the Allies. By engaging with these sensitive and often conflicting aspects of memory, these sound monuments contribute to the ongoing process of reflection and reconciliation.

BILL FONTANA'S "DISTANT TRAINS" (1984)

Being an American composer, Bill Fontana (b. 1947) developed an international reputation for his pioneering experiments in sound. Since the early 1970's Fontana has used sound as a sculptural medium to interact with and transform visitors' perceptions of visual and architectural spaces. He created sound sculptures and radio projects for museums and broadcast organizations around the world.

Distant Trains was created in 1984, the artwork was exhibited for one month in Berlin at the ruins of Anhalter Bahnhof, once one of Europe's busiest train stations before its destruction in World War II. Devastated by bombing during the war, it was formally decommissioned in 1952. For this piece, Fontana buried loudspeakers in the empty field of the station's former site, transmitting

Figure 2: Documentation of the "Distant Trains", Bill Fontana, 1984
From DISTANT TRAINS: Berliner Künstlerprogramm des DAAD, Berlin, 1984, by B. Fontana, n.d.
(https://www.resoundings.info/distant-trains-berlin-1984).

live sound from Köln Hauptbahnhof, a bustling station in Cologne. This real-time sound recreated a "phantom" acoustic environment, overlaying past activity onto the station's silent, empty space.

The analysis of *Distant Trains*, a sound sculpture by Bill Fontana, is based on the artist's web portfolio,[1] which features a video slideshow accompanied by the original site recording. The video, lasting 03:10, documents the installation at Anhalter Bahnhof, a once-bustling train station in Berlin, now a large empty field. The station's legacy is revisited through the sound sculpture, which transmits live the acoustic environment of the Köln Hauptbahnhof, Europe's busiest contemporary train station.

Sound object analysis

In *Distant Trains*, two primary types of sounds emerge as distinct sound objects: the mechanical sounds of steam trains and the ambient noises of a busy station. These elements evoke the multi-layered historical experience of the site. The video starts with ambient noises of the busy train station, the loudest of them are the voices with station announcements.

Attack: Sudden bursts of voices and station announcements appear at different volumes and in different distances of the listener.

Body: The layered mix of voices, footsteps, and low-frequency rumbles forms a dense auditory environment, situating the listener in the bustling environment of a train station.

Decay: These sounds gradually fade, blending with the diminishing train noises and leaving a quieter atmosphere.

Another distinguishable sound is the whistle of arriving or departing trains. While softer than the audio announcements, these whistles remain perceptible and contribute to the layered soundscape. The sound of moving trains is audible throughout the audio at varying volumes, but this analysis focuses on the whistle occurring between 1:01 and 1:07.

Attack: The steam whistle gradually intensifies, piercing the soundscape as it grows louder, mimicking the train's approach. Its slow, measured onset gives it a gradual attack.

Body: The sound transitions into the rhythmic clatter of wheels and the continuous tone of the whistle, evoking the momentum of a train beginning its departure.

Decay: As the train moves away, the whistle and wheel sounds steadily diminish, fading into the ambient echoes of the environment.

Sound event analysis

The sound event captures the signals of a busy train station, where sound becomes a symbol of life and functionality. Historically, the sounds of trains symbolize industrial progress, while in the context of the Holocaust, they carry the darker connotations of deportation and displacement. This dual symbolism derives from placing the ordinary sounds of a train station within the ruins and an empty field of the Anhalter Bahnhof.

The ambient hum of the station, blending distant reverberations with the low-frequency rumble of trains, serves as the keynote sound. This sonic foundation immerses the listener in the station's acoustic environment. The distinctive steam train sounds can act as auditory landmarks, known within the communities of Berlin. They encapsulate its dual legacy as a monument to industrial progress and a somber reminder of human tragedy, amplifying its role as a site of memory.

MARKUS KISON'S "TOUCHED ECHO" (2007)

Markus Kison (b. 1977) is a German artist based in Berlin. *Touched Echo* is a piece of public art, "a minimal media intervention set within a public space". It is placed in the Brühl's Terrace in Dresden, Germany. Using bone-conduction technology developed originally for hearing devices, the installation transmits sounds of the cities which were devastated on February 13, 1945 in carpet bombing, through the arms of the visitors when they rest their elbows on the balustrade and hold their ears closed.[2]

1 https://www.resoundings.info/distant-trains-berlin-1984

2 Description and documentation of Touched Echo can be found on Marcus Kison's official web page: https://www.markuskison.de/touched-echo.html

Figure 3: Touched Echo by Markus Kison
From Touched Echo, by M. Kison, 2007 (http://www.markuskison.de/touched-echo.html).

Markus Kison is using a recording of "the horrendous noise of the explosions" and "the sound of airplanes and explosions", as mentioned in the artwork's description.[3] The sound object and sound event analysis could be made on the basis of the sounds we hear at 0:56–1:20 minutes in the video.

Sound object analysis

Two primary sounds can be identified: the sound of airplanes and the sound of bombs falling on the city. Airplane sounds high in the sky can be heard at 0:56–1:06, it seems like two airplanes approaching in the distance (0:56–0:59), another one is significantly closer to the recorder (1:01–1:06).

Attack: The sound begins with the high-intensity noise of airplane engines, characterized by a slow attack that gradually introduces the auditory presence of the planes.

Body: A steady, repetitive, rhythmic industrial sound, with the continuous hum of engines signifying the approach of the planes.

Decay: The sound diminishes as the planes move away from the listener, marked by fading intensity and reverberation.

The sound of bombing is being introduced at 1:07 and lasts until 1:20, it is placed at a significant distance from the listener as well. It follows the sound of airplanes.

Attack: The onset is sharp, abrupt, fast rhythm, representing the series of explosions. This phase is characterized by a fast attack.

Body: The echoes of explosions and destructions follows one another, capturing the auditory imprint of buildings collapsing in the distance.

Decay: The sound gradually fades, with reverberations blending into the ambient noise, evoking the lingering aftermath of the explosions.

Sound event analysis

For the sound event analysis we need to consider the sounds of airplanes and explosions as signals, symbols, keynotes or soundmarks. The sharp, piercing air raid sirens act as auditory signals of imminent danger, immediately immersing the listener in the historical context and triggering a sense of urgency. On the symbolic level, the sound of airplanes and bombing together functions as a symbol of war times and war's destructive impact, particularly referencing the bombing of Dresden during World War II. Also, from the texture and the quality of recording they are clearly historical sounds, symbolizing the past.

The persistent hum of airplane engines and ambient wartime sounds, machine noises serve as keynotes, forming the auditory background of the piece and situating it firmly in the historical context of urban warfare. These recurring elements create a sonic atmosphere of those times. The distinct sounds of airplanes and bomb explosions can be regarded as soundmarks, uniquely tied to the cultural memory of Dresden's destruction. They stand out as iconic auditory elements, evoking collective memory and emotional resonance associated with the historical trauma of war.

NIKITA KADAN'S "THE INHABITANTS OF COLOSSEUM" (2018)

Ukrainian artist Nikita Kadan (b. 1982), based in Kyiv, created *The Inhabitants of Colosseum* (2018) in Regensburg. This piece reflects on a satellite of the Flossenbürg concentration camp established in the guesthouse "Colosseum" in 1945, where around 400 prisoners from across Europe were forced into railway repair work. Ukrainian guards oversaw the prisoners, and more than 10% of them died within five weeks. The artist invited 400 volunteers to wear wooden slippers, like those worn by the prisoners, and silently

3 https://www.markuskison.de/touched-echo.html

Figure 4: Documentation of the performance "The Inhabitants of Colosseum"
From #WeRemember Nikita Kadan, "The Inhabitants of Colosseum Performance", by donumenta e.V., 2021 (https://www.youtube.com/watch?v=-WHqkSbzuXQ&t=5s).

walk across the Stone Bridge, retracing their steps. The sound of their footsteps was recorded and turned into a sound sculpture.[4]

I provide an analytical framework for understanding the sound objects and sound events as documented in the video recording of *The Inhabitants of Colosseum,*[5] a participatory performance staged by Nikita Kadan in Regensburg in 2018. The performance, captured in a video lasting 1 minute and 5 seconds, presents a mixed auditory environment featuring two main types of sounds: the clatter of wooden shoes on the stone bridge and intermittent unintelligible human voices. These sounds have to be regarded within the work's broader historical and commemorative contexts.

Sound object analysis

The predominant sound object in the performance is the rhythmic, repetitive clatter of wooden shoes striking the bridge's stones. This sound is loud and intense, becoming discernible from the first seconds (0:01) and persisting throughout the performance. However, isolating this sound as a distinct sound object proves challenging due to the collective nature of its production. Ideally, the sound of a single pair of wooden shoes could serve as a clearer object of analysis, but in the context of the performance, the sound must be approached as a collective sonic act.

Attack: The sound is characterized by a rapid attack, with each step producing a sharp, beating impact as wooden soles meet stone.

Body: The repetitive continuity of the steps creates an echoing effect, emphasizing the layered nature of the sound object.

Decay: As participants move across the bridge and into the distance, the sound gradually fades, and its volume diminishes.

Another sound that should be mentioned are the distant human voices appearing clearly at 0:21–0:23; they are very silent, and basically consist of the fast attack that fades quickly.

Sound event analysis

The sound events of *The Inhabitants of Colosseum* connect audiences to the historical and sociopolitical themes of the artwork. The clatter of wooden shoes functions on multiple levels. In general, the sound signalizing the collective action of walking, the group dynamic is in the focus. On the symbolical level, the mechanical and rhythmic nature of the sound alludes to the machinery of war, industry, and systemic exploitation. It speaks to themes of destruction, routine, labor, and the dehumanizing forces of violence.

In the particular context of Regensburg's history, the clatter of wooden shoes carried a specific cultural resonance, familiar to civilians during the time period referenced by the performance, so it functions as a community sound, as a soundmark in that sense. For the contemporary audiences outside the Regensburg cultural history, this sound could symbolize the presence of prisoners or forced laborers, making its reintroduction a powerful auditory reminder of historical suffering.

In addition to that, particularly when detached from its video and visual context, the clatter takes on an alien quality. It recalls the sounds of horseshoes or industrial machinery, reinforcing the dehumanizing and mechanical undertones.

The intermittent voices that appear throughout the performance add a contrasting dimension; they sound like keynotes, the background ordinary urban sounds. These human sounds, representing the life of the city, are periodically interrupted by the harshness of the clattering steps. This juxtaposition heightens the emotional

4 A more detailed description is given at the Danube Art Lab's page: https://www.regensburg.de/kultur/eu-kulturprojekte/kulturplattform-donauraum/danube-art-lab/nikita-kadan
5 https://www.youtube.com/watch?v=-WHqkSbzuXQ&t=5s

impact of the sound events, mirroring the fragility of life and the intrusion of systemic violence into the everyday. The performance appears as a sonic intervention, which was realized by the collective body's sound making.

COMPARATIVE ANALYSIS OF THE CASE STUDIES

Through the nuances of these works, one can see differences in the creators' backgrounds and artistic contexts. Bill Fontana, Markus Kison, and Nikita Kadan each hail from different countries and historical momentums, bringing individual perspectives to the role of sound in memory and commemoration. These distinctions, which will be explored in the following analysis, open the door to a broader examination of the memorial function of sound sculptures.

Firstly, the artistic backgrounds and approaches are different—Fontana, Kison, and Kadan bring different art practices and have different artistic statements. Bill Fontana, as a composer and sound artist, is using sound as a "sculptural medium" (Fontana n.d.) and focusing on transforming spaces through live sound transmission, often using real-time acoustic environments to reshape visitors' perception of place. Marcus Kison is a representative of new media art and "interested in our engagement with physical objects" (Kison n.d.); in his practice he makes minimal media interventions and creates installations. Nikita Kadan is a multimedia artist; he "works with installation, sculpture, painting, graphics, often in interdisciplinary collaboration with historians, architects and human rights activists" (Kadan n.d.). Additionally, temporal and cultural contexts of the initial productions differ as well: the works were created in different decades—1984, 2007, and 2018—reflecting the varying artistic, technological, and historical concerns of each period.

Secondly, mediums and methods of sound transmission are not similar: each artist utilizes a distinct method for reproducing the sound. Fontana's *Distant Trains* uses live broadcasting, transmitting sound through the systems of live microphones and loudspeakers. Kison's *Touched Echo* relies on bone conduction, a technology developed for hearing devices allowing visitors to feel historical sounds through touch. Kadan's *The Inhabitants of Colosseum* uses recorded footsteps from a performative reenactment, presenting sound as a documentation of action.

Thirdly, performative aspects: performance plays varying roles across the three works. In *Distant Trains*, there is no direct performative element; the sound environment functions autonomously inside the ruins. *Touched Echo* requires recipients' cooperation—visitors become performers themselves by touching the installation and assuming a specific pose. Kadan's work, however, directly incorporates performative reenactment, as volunteers physically retrace the path of the prisoners, linking bodily engagement to sonic memory.

Fourthly, the relation between sound production and action can be established. In Fontana's sound sculpture, sound exists independently, with no action required from the audience beyond listening. In Kison's work, the action of physical touch is necessary for reactivating the sound. Kadan's piece, however, blends action with sound as the movement of the participants is inseparable from the auditory experience.

Fifthly, social dynamics and the embodied experience are especially prominent in *Touched Echo* and *The Inhabitants of Colosseum*. In *Touched Echo*, though the experience is individualized, the shared act of touching the installation creates a social bond between the visitors, as each person physically activates the sound and embodies the historical memory in their own way. In Nikita Kadan's work, the social aspect is amplified, as the collective performance of history by a group fosters a sense of communal memory and shared responsibility. The embodied nature of both works—through touch and physical movement—forces the participants to confront the history with their bodies, imbuing the sound with a tactile and performative dimension that transcends simple auditory perception. Thus, the varying levels of interactivity and embodiment across the works create different relational dynamics between sound, action, and audience. *Distant Trains* represents a passive auditory experience, *Touched Echo* makes the listener an active, individual participant, and *The Inhabitants of Colosseum* emphasizes collective action and shared historical engagement.

Finally, returning to the problems of concepts and typologies, the works are being described differently. While *Distant Trains* is being described as sound sculpture (Fontana n.d.), *Touched Echo* has been put under the name of sound installation (Kison n.d.). *The Inhabitants of Colosseum* is referred to as both sound sculpture and social sculpture (Kadan 2018). In these ways, the terms "sound installation", "sound sculpture", and "social sculpture" present overlapping and sometimes ambiguous boundaries.

CONCLUSION

Sound sculptures can be considered multimodal texts that integrate sound, space, and other modalities to create cohesive systems of meaning. With the development of their conceptual dimension, these art forms have acquired the potential to reawaken memories through creating specific kinds of sonic experiences for the audience. The artworks discussed in this text show how, through the use of historical sounds, the perception of spaces is significantly changed. Moments of resonance with the past are created, both metaphorically and through direct sensory engagement.

The analysis of sound object, sound event, and soundscape—drawn from the acoustic ecology framework—helps articulate the sound modality within these works and makes it possible to approach sound from the listener's perspective, as something perceived and interpreted within a particular spatial and historical context. These sonic elements function not only as experiential components but also as semiotic resources

that carry meaning through their material and symbolic presence.

However, while sound can be discussed and categorized in verbal terms, language often struggles to convey its sensory and affective depth. Descriptions may provide the structural outlines of what is heard, but they rarely capture how sound is experienced or felt. This points to the importance of thinking more about the embodied, perceptual dimension of listening. In this regard, sound sculptures—such as those discussed in the text—are good cases, as they presuppose modelling and emphasis on the listener's experience.

Thus, engaging with sonic traces of the past reflects a broader shift toward sensory approaches in historical scholarship. Moving forward, I aim to investigate further how sound sculptures can serve as sound monuments or memorials—forms that link sensory experience with collective memory.

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