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The soundscape as a learning environment: the importance of sounds in the construction of sense of place and in geographic learning

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Soundscape as a learning environment: the role of sound in constructing a sense of place and in geography learning

Abstract

Landscape, often studied in a visual perspective, can be better understood through a multisensory approach. This article explores the role of soundscape as a learning environment, emphasizing the importance of sounds in constructing a sense of place and in geographical learning. Based on Murray Schafer's studies on soundscape, sound emerges as an essential element in understanding the relation between space, landscape, and cultural identity. Using auditory methodologies, sounds are analyzed for their ability to contribute to place formation, showing how soundscape can be an educational tool. The article investigates how sound, by integrating different sensory stimuli and languages, can promote more inclusive geographical learning and stimulate a critical and emotional understanding of the territory.

Keywords: Soundscape. Multisensory learning. Geography education. Sound perception. Active listening.

A paisagem sonora como ambiente de aprendizagem: a importância dos sons na construção do sentido de lugar e na aprendizagem geográfica

Resumo

A paisagem, frequentemente estudada por meio de uma perspectiva visual, pode ser compreendida de maneira mais profunda por meio de uma abordagem multissensorial. Este artigo explora o papel da paisagem sonora como ambiente de aprendizagem, destacando a importância dos sons na construção do sentido de lugar e no aprendizado geográfico. Com base nos estudos de Murray Schafer sobre *soundscape*, o som emerge como um elemento essencial para entender a relação entre espaço, paisagem e identidade cultural. Por meio de metodologias auditivas, os sons são analisados por sua capacidade de contribuir para a formação do lugar, mostrando como a paisagem sonora pode ser uma ferramenta educativa.

O artigo investiga como o som, integrando diferentes estímulos sensoriais e linguagens, pode promover um aprendizado geográfico mais inclusivo e estimular uma compreensão crítica e afetiva do território.

Palavras-chave: Paisagem sonora. Aprendizagem multissensorial. Didática da geografia. Percepção sonora. Escuta ativa.

El paisaje sonoro como entorno de aprendizaje: la importancia de los sonidos en la construcción del sentido de lugar y en el aprendizaje

Resumen

El paisaje suele estudiarse desde una perspectiva visual y se puede entender más profundamente mediante un enfoque multisensorial. Este artículo explora el papel del paisaje sonoro como entorno de aprendizaje al destacar la importancia de los sonidos en la construcción de un sentido de lugar y en el aprendizaje geográfico. A partir de los estudios de Murray Schafer sobre paisaje sonoro, el sonido emerge como un elemento imprescindible para comprender la relación entre espacio, paisaje e identidad cultural. A partir del uso de las metodologías auditivas, se analiza la capacidad de los sonidos para contribuir a la formación del lugar al mostrar cómo el paisaje sonoro puede ser una herramienta educativa. Este artículo investiga cómo el sonido desde diferentes estímulos sensoriales y lenguajes puede promover un aprendizaje geográfico más inclusivo y estimular una comprensión crítica y afectiva del territorio.

Palabras clave: Paisaje sonoro. Aprendizaje multisensorial. Didáctica de la geografía. Percepción del sonido. Escucha activa.

Il paesaggio sonoro come ambiente di apprendimento: l'importanza dei suoni nella costruzione del senso del luogo e nell'apprendimento geografico

Riassunto

Il paesaggio, spesso studiato attraverso una prospettiva visiva, può essere compreso in modo più profondo attraverso un approccio multisensoriale. Questo

articolo esplora il ruolo del paesaggio sonoro come ambiente di apprendimento, sottolineando l'importanza dei suoni nella costruzione del senso di luogo e nell'apprendimento geografico. Basandosi sugli studi di Murray Schafer sul *soundscape*, il suono emerge come un elemento essenziale per comprendere la relazione tra spazio, paesaggio e identità culturale. Attraverso l'uso di metodologie uditive, i suoni sono analizzati per la loro capacità di contribuire alla formazione del luogo, mostrando come il paesaggio sonoro possa essere uno strumento educativo. L'articolo indaga come il suono, integrando diversi stimoli sensoriali e linguaggi, possa promuovere un apprendimento geografico più inclusivo e stimolare una comprensione critica e affettiva del territorio.

Parole chiave: Paesaggio sonoro. Apprendimento multisensoriale. Didattica della geografia. Percezione sonora. Ascolto attivo.

INTRODUCTION

Geography is primarily studied through visual activities, despite literature demonstrating that multisensory experiences facilitate learning. However, geographical inquiry can go beyond closed codes, involving a polysemy of languages that includes sounds and the linguistic dimension.

Starting from studies on the soundscape, sound has gained importance among geographers who have focused on the relationship between spaces, landscapes, places, and sounds, with particular attention to affective and emotional impacts (Paiva; Brito-Henriques, 2019). Moreover, auditory methodologies are being experimented with in geographical research to highlight the components that contribute to the creation of place (Kinkaid; Emard; Senanayake, 2020). When considering narrative, orality has always been a way for individuals to interpret the reality in which humans attribute meaning to experiences and places based on their social and cultural conditions (McClennen, 2016).

The purpose of this work is to explore the role of the soundscape as a learning environment, highlighting how sounds contribute to the construction of a sense of place and facilitate geographic learning. Drawing from Murray Schäfer's (1985; 1998) research on soundscapes, this study emphasizes the importance of sound as a key element in understanding the connections between space, landscape, and cultural identity. By utilizing auditory methodologies, the analysis focuses on how sounds shape the perception of place, positioning the soundscape as a valuable educational tool.

The aim of this article is to address terms and concepts related to the universe of soundscapes, promoting reflection on its application in geographic education. In the first part, theoretical considerations on the concepts associated with soundscapes will be presented. Subsequently, we will discuss perception and the development of geographical reasoning, highlighting its implications for understanding space. Finally, we will explore the dimensions of the chronotope, emphasizing objective and concrete aspects, the interpretation of territoriality, and the relevance of geographic meaning. Throughout the discussions, examples of activities

developed in soundscape projects in the Canton of Ticino, Switzerland, will be presented. This structure aims to provide a comprehensive understanding of the importance of soundscapes in the context of geography education.

From landscape to soundscape

The concept of landscape, historically more tied to artistic and literary creation than to the scientific rigor of Geography, has evolved significantly since the late 18th century, particularly with the contributions of naturalists like Alexander von Humboldt and Carl Ritter. These thinkers not only expanded the understanding of landscape as an object of contemplation but also established a new approach that integrated systematic observation and the search for natural laws (Gomes, 2017). From this perspective, landscape was recognized as a complex phenomenon, where dynamic interactions between natural and social elements manifest, giving modern geography the ability to articulate the study of nature in its entirety. This epistemological transformation allowed the landscape to be considered not only as an aesthetic representation but also as an indicator of the organization and functioning of natural systems, incorporating an analytical dimension that has been fundamental to the advancement of contemporary geographic knowledge (Vitte, 2007; Castellanos, 2021).

In contemporary geography, the concept of landscape is approached through various dimensions, leading to a certain polysemy, depending on the focus and epistemological approach adopted by researchers. This multiplicity allows landscape to be understood from different perspectives, with the aim of elucidating the totality of its constituent elements. One of the most significant potentials of this concept lies in the possibility of interaction between different meanings. Landscapes are not limited to shapes and colors; within these elements, there are also sounds, smells, and tastes that enrich and deepen our perceptions. This perspective broadens the analysis of landscape as a manifestation of spatiality, configuring it not only as a visual image but as an integrated sensory experience (Castrogiovanni *et al.*, 2023).

Building on this view, Raffestin's perspective further elaborates on the notion of landscape, suggesting that its acoustic properties embody both an objective, quantifiable component, and a subjective one, linked to individual and community perceptions. This dual nature aligns with the broader concept of landscape as an "immaterial reality resulting from a mental production process, originating from a human gaze, itself mediated by different languages" (Raffestin, 2012). It is therefore not about overturning the hierarchy of representational systems, but rather considering human perception as a multimodal apparatus that draws on diverse information and codes. Within this system, sound emerges as a valuable element for integration and interpretation, with distinctive features that make it a privileged key—at times even indispensable—for understanding reality and establishing meaningful connections between a wide variety of semiotic elements. This fosters a holistic approach to the cultural, historical, and social dimensions of space.

The multimodality expressed here calls upon various disciplinary domains: from geography to music, from history to literature and second languages, from the arts to the sciences. This integrated approach enhances the analysis of the soundscape, allowing it to serve as an essential

tool in both geographic inquiry and education, promoting a deeper engagement with place and space through the full spectrum of sensory and linguistic stimuli.

In this context, the relationship between visual landscape and soundscape becomes particularly relevant. The analysis of the soundscape, which will be explored in the following paragraphs, offers a deeper understanding of this discussion, considering how sounds integrate with visual elements and with the overall sensory experience of the landscape. In this way, the landscape is not merely a collection of visible features but an integrated sensory phenomenon, where each element contributes to a more holistic understanding of the space we inhabit. This perspective, which articulates various dimensions of the geographic experience, enriches the analysis of the landscape and reveals the complexities of the relationship between humans and their environment.

The soundscape

The concept of the soundscape has a rich history that spans various disciplines, including music, geography, and the performing arts. It refers to “all the sound events that coexist in a given environment and are perceived by an individual or a group.” The term “landscape,” widely discussed in geography, emphasizes the complexity of the interactions between humans and the environment, and in this context, the soundscape reveals the importance of sound in the construction of a sense of place and in geographic learning (Rocca, 2019a, 2019b, 2020).

Beyond being an acoustic phenomenon, the soundscape is deeply tied to the cultural and social identity of a territory. Just as every environment has its distinctive sounds, these sounds become cultural markers that reflect the practices, rituals, and relationships of people with their spaces. In this sense, the soundscape is not static: it evolves over time according to social, economic, and environmental changes. For example, the sounds of a city can change drastically with technological advancements or increased traffic, altering not only the soundscape but also the perception of the place itself.

In this context, the concept of the soundmark - a term coined by Schäfer to indicate a characteristic sound of a community - becomes crucial for understanding how people identify with a territory. A soundmark might be the sound of church bells, the noise of the sea, or the sounds of productive activities in a specific region. The importance of these sounds goes beyond mere sensory perception: they actively contribute to the construction of collective memory and the definition of an emotional territoriality.

In the field of music, the soundscape has been a source of inspiration for many composers. The sound of the wind, birdsong, the noise of water or thunder have been used by composers like Antonio Vivaldi, Igor Stravinsky, and Olivier Messiaen to enrich the timbral palette of their works. It is not only natural sounds: the noise of typewriters, airplane engines, and sirens have been incorporated into musical works to create new sound textures. These sonic elements, often considered noise, are transformed into true musical compositions through a creative process that goes beyond mere recording. Soundscape composition is a musical genre that uses environmental sounds to create compositions that not only reproduce the auditory reality but reinterpret it. This genre emerged thanks to the work of the World

Soundscape Project (WSP), founded by R. Murray Schäfer in the late 1960s. The sound recordings of natural and urban environments form the basis of these compositions, and the original context from which they come plays an essential role in creating meaning and associations for the listener. Unlike electroacoustic music, where sound often loses its original context, in soundscape composition the connection to the context is preserved, leading the listener to develop a greater awareness of the soundscape.

Geography, traditionally dominated by a visual perspective, has recently re-evaluated the sonic component as essential to understanding the relationships between humans and the environment. The soundscape is not merely a byproduct of the interaction between natural phenomena and social activities, but it represents a true “composition.” This evaluation highlights how sound is a social product that contributes to the construction of a sense of place. Sound, in fact, becomes an indicator of a territory’s history and cultural identity.

Another fundamental aspect to consider is the concept of acoustic ecology, also developed by Schäfer and the World Soundscape Project. Acoustic ecology studies the relationships between humans and the environment through sound, with the goal of raising awareness towards critical and conscious listening of the sounds around them. This approach has direct implications for environmental sustainability: sounds such as traffic or noise pollution can compromise the quality of life and human health. In this sense, acoustic ecology serves not only as a tool for analysis but also as a method for promoting acoustic well-being and improving the quality of the urban and natural environment.

The soundscape represents an important resource for geographic education. Through active listening to environmental sounds, students can develop a deeper understanding of the territory and its dynamics. Auditory methodologies, such as soundwalking¹, allow for a critical and creative exploration of the landscape, stimulating an emotional connection with the surrounding environment. In this sense, the soundscape not only enriches multisensory learning but also promotes a more inclusive geographic education, capable of grasping the complexity of the relationships between humans and the environment.

The concept of the soundscape thus sits at the intersection of art, geography, and pedagogy, offering a powerful tool for exploring the world through mindful listening to the sounds that inhabit it.

Delving into the soundscape, it becomes clear that sound is ephemeral: it touches us briefly and then quickly disappears. The sound is like a ghost that constantly surrounds us; it is air and vibration, tremor or pressure, and we perceive it depending on circumstances, whether they are pleasure, pain, or fear. Beyond its rational dimension, sound conceals an affective and emotional dimension. Naturally, in order to understand it, we must stop listening, letting the sounds, like an embryo, caress us, rooting themselves more consciously within us through a continuous attribution of meaning.

¹ Soundwalking is a practice that involves exploring an environment while consciously paying attention to the surrounding sounds, allowing participants to connect more deeply with the soundscape. During the walk, usually in silence, individuals listen to and observe natural sounds, urban noises, and human interactions, fostering an appreciation of the environment and increasing awareness of how sounds influence our perception of space. This practice can be used in artistic, educational, and research contexts.

The sound is ephemeral but simultaneously powerful. It manifests quickly, leaving emotional and affective traces that settle in the landscape like symbolic rocks. This sedimentation creates an identity bond between the place and the community that inhabits it, as evidenced in the concept of soundmark (Truax, 1978), where a characteristic sound becomes a territorial symbol. In this sense, active listening becomes a fundamental practice for transforming space into place.

Below is a Japanese ideogram that represents the concept of listening. The ideogram is composed of symbols that refer to the ear, the eyes, focused/active listening, and the heart, highlighting the complexity and depth of the act of listening by integrating both physical and emotional aspects (Figure 1).

Figure 1 – The ideogram that represents the concept of listening



Source: Ricostruzione... (2025).

The left side is represented by the wise man, who has a large ear (at the top left), symbolizing his ability to listen to people. The right side of the drawing represents virtue, encompassing several elements: at the top right, the symbol of ten eyes signifies that listening involves not only hearing but also seeing. At the bottom right is the heart-mind, with a line above it that represents unity. This suggests that eye and heart cannot act separately to achieve the ability to truly listen.

Silence, the zero point of listening

An image by Walter Murch², a sound editor and renowned North American sound designer, likens the womb to a space we perceive as characterized by the absence of sound

² Walter Murch is a famous American publisher and Sound Designer. He won the Oscar for best editing for *The English Patient* and the Oscar for best sound mixing for the films *Apocalypse Now* and *The English Patient*.

or pure isolation, which actually presents the same decibel level as a car driving at 100 km/h with the windows down. The mother's heartbeat and internal noises are, for the fetus, the first experience of silence, which we technically label as "noise."

In the first moments of life, the rhythm of the mother's heart is no longer present, but the newborn - the most resilient being in humanity—may search for these sounds. Let's observe the newborn. We may attribute discomfort to them; we may think they are searching for those familiar noises, but we cannot be certain of this. If we think about it, many things change now of birth. The newborn's skin meets the air, their nostrils fully absorb the scents they encounter, and their ears, now exposed, pick up sounds and voices that they previously heard only in the background. From here begins the long journey of constructing their identity.

This process begins precisely through experimentation with sounds and silences. The first action a baby takes is to cry, and through this, they unconsciously confront their own voice. Through this, they learn how their cries elicit reactions from their surroundings, starting that long process of experimentation between assimilation and accommodation that leads to the progressive awareness of self. It is a long process, initially unconscious, but it always starts with silence. A mother knows that everything is fine when sleep is silent, but when the silence becomes deafening, it means something is wrong.

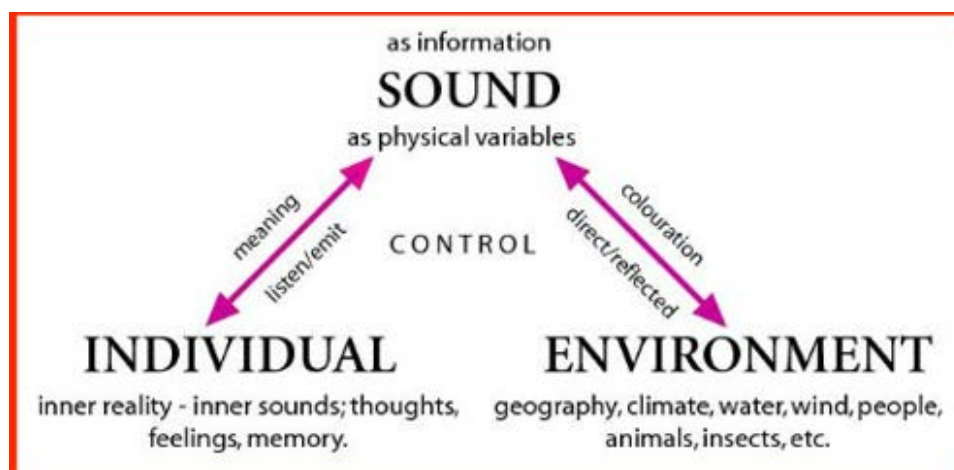
Perception, thought, and action on (and toward) the environment

A mental image is formed not as a direct reproduction of the real world (it is not a mere photocopy), but rather as one shaped—selected and influenced—first by the individual's sensory system and then by their values. Consequently, the decisions made by an individual are not directly based on the real world itself, but on their personal mental representation of it. When acted upon, these decisions manifest in visible behaviors within the real world, which tend to become regular over time, thus forming a distinctive pattern of behavior. Alternatively, these decisions may lead to further exploration of the real world until the individual deems the process complete.

Perception and action are fundamentally interdependent: I will act upon the environment according to how I perceive it, and I will also perceive the environment based on how I am able to act upon it (Carre, 2008; Mainardi Peron, Falchero, 1994). The decision-making process, therefore, becomes increasingly disconnected from objective reality and more influenced by the individual's subjective perception of the world (Bianchi; Perussia, 1980).

In this integrated framework, the feedback loop between perception and action is central to understanding human behavior, as each informs and reinforces the other in shaping our interaction with the environment.

Figure 2 – Soundscapes relationships.



Source: Wrightson, 2000.

From mental images of the soundscape to the development of geographic reasoning

The foundation of mental imagery lies in thought, which plays a crucial role in organizing information and enabling individuals to mentally represent it. Through thought, individuals not only imagine information but also act upon it, establishing a connection between mental representation and practical action. The fundamental structures of thought include mental images, which refer to visual representations of objects, scenes, and events, activated by environmental sounds, as well as concepts, which are sets of characteristics associated with a specific representation. Vygotsky (1966) argues that concepts are often described by words, which, for many scholars, are not only the final outcome of the conceptualization process but also support and guide the entire thinking process.

Within the spectrum of thought, reasoning stands out as an essential form, which can be classified into various types, such as deductive and inductive reasoning, problem-solving, and creative thinking. Deductive reasoning starts from general premises to arrive at specific conclusions, while inductive reasoning does the opposite, drawing generalizations from specific observations. Problem-solving involves applying cognitive strategies to find solutions to specific challenges, whereas creative thinking allows for the generation of new ideas and innovative approaches. These different forms of reasoning are interconnected and, together, contribute to the complexity and richness of the human thought process, shaping how we perceive and interact with the world around us.

Geographic reasoning plays a fundamental role in understanding natural, social, and economic phenomena and processes within specific spatial contexts. This type of reasoning is activated when we seek to comprehend complex situations, enabling us to deeply analyze the dynamics that shape geographical spaces (Botelho; Valadão; Rocca, 2023).

When considering the potential of listening to the landscape, a crucial element emerges for understanding specific situations: sound. As previously mentioned, noise allows us to perceive

the rhythm of activities and the passage of time that characterizes both human and natural actions. This dimension, sound, enables a deeper understanding of events and the organization of a geographical space, revealing the interactions and dynamics that define it. By considering the soundscape, one can not only identify the activities taking place in a given environment but also interpret the relationships between its components, contributing to a more integrated and nuanced analysis of the territory. In this way, listening becomes a valuable tool in geographical research, enriching the understanding of the complexity of human and environmental interactions.

We believe that developing geographic reasoning requires systematic argumentation, as this allows for the decomposition of elements and the understanding of the relationships and connections that exist within a complex network (Botelho; Valadão; Rocca, 2024). This approach enables the researcher to demystify the intricate web of interactions that characterize geographical phenomena. To guide this inquiry, the formulation of authentic questions is essential, prompting the exploration of “where?”, “how?”, and “why?”. These interrogative adverbs, used to formulate questions seeking information about place, manner, and cause, are fundamental in constructing inquiries that foster exploration and analysis of different aspects of a situation or phenomenon. “Where?” refers to location, allowing the identification of spatiality; “how?” addresses manner, facilitating the understanding of processes and dynamics; and “why?” investigates reasons, deepening the analysis of underlying causes.

This set of questions promotes the understanding of fundamental aspects of spatiality and similarly allows for consideration of the absolute, relative, and relational dimensions of geographical space, as well as taking into account temporality, scale, and the processes involved (Roque Ascensão; Valadão; Silva, 2018). In this way, the use of these questions serves as a methodological guide that directs the analysis, allowing for a more profound and contextualized understanding of the dynamics shaping geographical space.

The analysis of the soundscape, situated within the realm of “geographies of imagination,” stimulates discovery and contributes to answering questions formulated through a methodological path that includes the interrogative adverbs. We propose, therefore, that the soundscape be explored in geography lessons, as we believe it enriches the imaginative dimension of geographic reasoning. This approach enables individuals to transcend immediate reality, explore alternative scenarios, and envision new possibilities for development.

By integrating systematic argumentation with the ability to imagine futures, geographic reasoning becomes a powerful tool for critical analysis and for formulating strategies of intervention in various spheres, contributing to a broader and more integrated understanding of geographical space and its dynamics.

Chronotope – the geographic fact/the sound space

To fully understand a chronotope, it is necessary to proceed with a triple reading: a denotative reading (where it is located, what it is, how it appears)—the geographic fact; a connotative reading (the territorialities it represents and the role it plays in analysis); and a sense-based reading (the values and perceptions associated with it).

Noises have always existed, even before the sounds produced by humans. From this formless container, different communities have extracted and isolated specific sounds, unconsciously promoting them to the status of identity sounds, capable of differentiating one community from another. These territorial “soundmarks” assimilate into the fabric of a society and, through memory, crystallize over time, acquiring meaning and becoming part of collective memory.

Sound, in fact, is a chronotope, a “territorial object” that “condenses a certain time and a certain place, crystallizing energy and information” (Bertoncin, 2004, p. 59). It is the expression of the material control that humans have exercised over territory over time, but it also reflects the organization of a given period (Rocca, 2017; 2019a; 2019b). Thus, each territory is characterized by a sedimented presence of sounds from various epochs; it conveys the idea of the evolution of a territory.

Furthermore, sound is pervasive and occupies every space, but at the same time, it is ephemeral and fleeting. It is never the same, does not remain fixed; it changes constantly, varying according to the time and place in which it is heard (Erkizia, 2017). The sounds around us help shape the space we inhabit and are a fundamental component of our life experience (Barra, Carlo, 2009, p. 32). Therefore, sound contributes to establishing an identity bond with the place, being an integral part of our culture, so much so that it is recognized by UNESCO (2003) as intangible heritage and an essential component of the landscape.

The Careggi Declaration on Soundscapes of 2012, referencing the European Landscape Convention, defines soundscape as: “the acoustic property of any landscape in relation to the specific perception of a species [...] it is the result of physical (geophonies), biological (biofonies), and human (anthropophonies) manifestations and dynamics” (Pieretti, 2012, p. 16).

Soundscapes: using sound to map invisible geographies

The idea of a sound map, commonly accepted, is closely linked to studies of soundscapes and geographical exploration practices that include sound in the representation of a specific place. The ways in which this relationship between sound and mapping is established are numerous. In the most widespread sense, a sound map is an interactive digital map, web-based, that allows users to listen to sound recordings through the use of clickable markers. These markers placed on the map locate sound documents within extensive acoustic archives. There are many examples of these maps; some projects are still active and continuously updated, while others have been abandoned. Sound maps can pertain to individual cities (e.g., Montreal Sound Map, Venice Sound Map), specific regions (like Basque Country Sound Map), or even the entire globe (Aporee, Cities and Memory). Often, these are collective archives, created collaboratively among professionals, or open platforms that allow users to contribute spontaneously, following specific criteria such as recording quality or duration.

In this context lies the Ticino Sound Map project, developed by the DFA of SUPSI (2019), which constitutes a participatory sound archive of Ticino. Audio files can be organized by tags and categories, offering a flexible and accessible overview of the recordings. However, while the more common model of “cartophony” sees sound anchored to the virtual map,

other forms of sound mapping reverse or overlap the relationship between map and sound. An example of mapping based solely on sound is “A Sound Map of the Hudson River” by Annea Lockwood (1989), a work that collects recordings made along the course of the Hudson River at 15 listening points, along with interviews with residents of the involved areas. Lockwood has also applied this format to the Danube, creating another acoustic map of that river.

Other works, of an installation nature, recreate sound maps of a place within another physical context. An example is “Inside the Circle of Fire - A Sheffield Sound Map” by Chris Watson, which reconstructs a sound map of the city of Sheffield in a museum setting (Hall, [202-]). Other forms of sound mapping go beyond the concept of a graphical map and are directly anchored to the territory through practices such as sound walking or listening walking. In these cases, the sound map can guide the path or even inscribe the territory itself, as seen in Land Art. A significant example is the work of Janet Cardiff, who uses binaural³ recordings and ear systems to create narrative paths in space. Similarly, Japanese artist Akio Suzuki transforms digital sound maps into the real world through *oto-date*⁴ paths, marking the asphalt or stone with physical markers that invite the listener to position themselves and listen to the surrounding environment.

However, the idea of sound mapping is not a contemporary invention. Long before the theorization of soundscapes and Sound Art, the “Songlines⁵” of Australian Aboriginal people provided a practical example of sound mapping: ritual songs were, at the same time, creation myths and maps of the territory. A digitized version of some of these lines was created by the Australian government, confirming the ongoing relevance of this tradition. The belief that sound can serve as a guide and orientation in the world inspired the international workshop “Soundmapping: a critical history of sonic cartography,” held in 2018 at the Convento del Bigorio in Switzerland and directed by American poet and historian Hillel Schwartz. The workshop raised a question that today no longer seems purely speculative: what would happen if we returned to using sound as the main tool for mapping our bodies, our cities, and the entire universe?

Tonic sounds these are the predominant sounds of the environment and/or climate that become auditory habits (the waves of the lake on the shore). Tonic sounds, according to Murray Schafer, a Canadian composer and theorist, are those sounds that distinctly characterize a specific sound environment, becoming an integral part of its identity. In other words, tonic sounds are the background sounds of an environment that, while often perceived unconsciously, help define the atmosphere and identity of a place (Schafer, 1977).

3 It refers to a recording and reproduction technique that simulates the way humans naturally hear. It uses two microphones positioned in a head-like configuration or like human anatomy to capture sounds in a way that reproduces a sense of three-dimensionality. This means that when listening to a binaural recording with headphones, the listener can perceive the location of sounds in space, as if they were truly present in the recorded scene.

4 *Oto-date* is a piece by Akio Suzuki, a Japanese artist, that invites people to stand still on specific spots of a given urban space. Such spots are marked by a pictogram that combines human footprints and ears. The project aims to stimulate people to listen to surrounding sounds without headphones. “*Oto-date*” is a junction of the ideograms “to listen” and “to spot,” creating the expression “listen spot,” taking inspiration from a traditional tea ceremony, held outdoors, called *nodate*. As people are supposed to stop and hear the city’s soundscape, the project indicates no soundtrack during the experience.

5 The “Songlines” of Australian Aborigines refer to paths and routes that are traced through songs, stories, and oral traditions. These songs not only tell creation stories and mythology but also serve as maps that guide communities through landscapes. Each song is linked to a specific place and its resources, helping Aborigines navigate and connect with the land.

The geographical becoming – sonic territories

The processes, evolution, and transformations of sound in space and time are often the result of anthropic activity, shaping what can be called sonic territories. Soundscapes serve as tools that allow us to explore reality in ways that visual representations cannot. To truly understand a territory, we must adopt multiple perspectives, utilizing not just sight but sound to perceive the environment in its entirety.

Educating about sound also means raising awareness in this sense, creating opportunities in which to accompany the young generations through unknown lands to discover. This is a holistic and complex challenge that uses various languages and approaches, encouraging individuals to “read between the lines,” to grasp what remains unsaid, and to step out of their comfort zones. Through sound, we tap into the joy of discovery, the wonder and amazement that comes with realizing one’s potential—even through mistakes. At the same time, sound teaches us about the power of fragility: like sound itself, fragility is fleeting, yet it has the extraordinary ability to open unexpected and unplanned paths.

Sound plays a crucial role in establishing an identity-based connection with place. It is such a fundamental aspect of our culture that, in 2003, UNESCO recognized sound as intangible heritage and an essential component of the landscape. While our ears are the primary organs for perceiving sound, this is not the only way we “listen.” We can perceive sound with nearly every part of our bodies, even through the pores of our skin. Compared to other species, however, human hearing is quite primitive—we cannot, for example, hear the vibrations caused by earthquakes or the high-frequency calls of some mammals used for communication.

Soundmarks are historically significant auditory signals, defined as “sound landmarks” in a community. These sounds are unique or possess qualities that make them particularly noteworthy to the people in that community. Because of their cultural value, soundmarks deserve preservation and protection.

Sound Signals, on the other hand, are any sounds or messages intended to be heard. They include pre-existing sounds designed to capture attention. These sound signals play an important role in regulating the life of a community and reflecting its character.

Hi-Fi Soundscapes refer to environments where the balance between sound and noise favors the former. In these soundscapes, even the most delicate and distant sounds are distinctly heard because the level of ambient noise is low. Each sound, however subtle, carries important information and emotional resonance. These environments are often associated with rural settings, nighttime, or ancient times—periods and places where there is a clear auditory hierarchy with a foreground, background, and spatial depth.

In contrast, Low-Fi Soundscapes are environments where individual sounds are “obscured” by dense background noise that masks and distorts them. In these settings, the sound-to-noise ratio is nearly 1:1, meaning that even ordinary sounds must be amplified to be heard. Urban environments, the hustle of daytime activity, and modern industrial settings often exemplify Low-Fi soundscapes, where the clarity of individual acoustic signals is lost in a generic broad-band noise. As Murray Schafer (1985) observed, “the most ordinary sounds need to be

amplified to be heard” in these environments, resulting in an overwhelming number of auditory signals and a lack of clarity due to masking effects.

This dichotomy between Hi-Fi and Low-Fi soundscapes highlights the significant impact of noise pollution on our ability to perceive and interpret the world around us. Where once every sound has meaning and resonance, modern soundscapes risk turning noise into a dominant feature, leaving us disconnected from the subtle but vital cues that sound provides.

A case study: the distant noise

The train, often perceived simply as a mode of transportation, takes on a more complex dimension when considered not only as a mechanical entity but as an element that creates auditory and spatial pathways and maps. It is not merely a movement through space and time; it is also a cultural representation in which distance is expressed sonically. The train, with its distant rumble, is not just a visual vanishing point; rather, it is a dynamic, ever-changing sonic viewpoint. It does not require a fixed source to be perceived but rather an attentive listening that captures it as a moving body, constantly escaping in sound.

The case study “The Distant Noise⁶” fits within this framework, exploring the different rhythms of the train: the technological rhythms tied to movement through space-time and those of the passengers, for whom the train represents a space where distance is perceived more in temporal than spatial terms. In the Canton of Ticino, the train has long been a distinctive sonic element, a territorial soundmark that has shaped the local soundscape since the early 20th century. As defined by Truax (1978), a soundmark is an auditory marker that characterizes a territory, making it recognizable through sound.

In this study, “The Distant Noise,” the territory of the Canton of Ticino is investigated, where the train has served as a territorial soundmark (Truax, 1978) since the early 1900s. The train is not merely a line of movement but a sonic experience that, while lacking a fixed source, moves through the landscape, following an invisible map. It becomes a “sonic viewpoint” that transforms into polyphonic narratives. Listening to the sounds of the train is not a passive act but a process of transforming space into place, where emotions and sonic memories intertwine.

The project “The Distant Noise” goes beyond traditional sound mapping, presenting itself as an exercise in collective memory that follows the polyphony of individual narratives. Listening to the train’s sounds transforms space into place, creating a sonic archipelago—an embodied experience rooted in the identity and emotions of those who traverse it. According to Yi-Fu Tuan, a place is a “field of attention” that gains meaning through the emotional investment of the people who inhabit it. Unlike space, dominated by metric relationships, the place is an acoustic domain where auditory relationships prevail over visual dimensions (Farinelli, 2017).

Listening, however, is a complex process involving both rationality and emotion. Through the sonic experience, the brain constantly processes sounds and integrates them with past experiences, creating a synthesis between what has been lived and what is being experienced

6 It is possible to access the route of a train in Canton Ticino (Il rumore lontano) on the page: <https://vimeo.com/815468362>

(Piaget; Inhelder, 1966; Milne et al., 2015). During fieldwork, in collaboration with sound artist Xabier Erkizia, the sound of trains in Ticino revealed invisible geographies. The journeys were not mere movements but paths of discovery of sounds that we perceive daily but rarely listen to with intent.

Despite its ephemeral nature, sound settles into the landscape like a rock, assuming a symbolic consistency and becoming an integral part of the territorial fabric. As Erkizia (2018) observed, sounds are fragile and fleeting, but they leave scars that imprint deeply on the territory and in the memory of its inhabitants. This auditory sedimentation, which involves the brain's capacity to recognize and interpret auditory variations (Milne et al., 2015), contributes to the formation of emotional geographies that shape our relationship with places. Every listener perceives sound differently, creating a mosaic of subjective experiences that shape the identity of the territory.

In the project “The Distant Noise,” sound art has made it evident how mindful listening can transform a space into a lived place, creating a geography of soundscapes. With the use of microphones, listening is amplified, allowing for a deeper understanding of the sounds and the relationships they generate. Listening is not a passive act but an active process of meaning-making, enabling us to grasp the complexity of the soundscape and the emotions that are interwoven within it. Through mindful listening, the soundscape becomes a sonic archipelago, a living place imbued with emotional significance, where sonic experience merges with the cultural and affective dimensions of the people who inhabit those places.

The train, with its rigid route and unmistakable sound, thus becomes a central element in the creation of emotional geographies. Listening to its sounds, resonating through the territory, allows us to explore new geographical and identity dimensions in a continuous dialogue between past and present, between the sound that settles into the landscape and the meaning it holds for the communities that inhabit it.

The geographical sense: the value of sound for the individual, the community, and the global society

The sound, as Schafer noted in *The Tuning of the World* (1977), encompasses “all the sounds that surround us, everything that our auditory perception is capable of capturing: a musical composition, a radio program, the sounds/noises of the environment in which we live every day.” This all-encompassing soundscape reflects not only the diversity of the auditory experience but also the subjective nature of how individuals and communities interact with sound.

The transition from space to landscape occurs at the very moment when one perceives reality. Reality, as perceived, no longer exists as it was; it becomes a geogram—a mental image of the material world (Raffestin, 2012). The relationship between geostructure and geogram is not linear. The auditory perception of a landscape does not derive directly from the real world; it is not a mere photocopy. The landscape is the result of a mental production process that originates from a human gaze, itself mediated by different languages, and is filtered first by the individual's sensory system and then by their values, beliefs, and traditions (Raffestin, 2012).

Sounds, unlike the cold and sterile descriptions found in scientific discourse, allow us to explore the *Terrae Incognitae* of the spirit and imagination. Narratives – whether literary or auditory – express, through their subjectivity, internalized, personal, and lived situations, demonstrating a remarkable ability to evoke territorial experiences (Lando, 2003).

The way we react to sound is complex. Sound Phobia occurs when a sound triggers fear or disgust. This often happens when a novel sound replaces an older, familiar one, or when a previously unnoticed sound signal becomes prominent. Certain sounds provoke negative responses because of unpleasant associations with what they represent. These can include bodily sounds or words, which may elicit moral, religious, aesthetic, or social disapproval, and some of these sounds may even become taboo.

Conversely, Sound Romance refers to the nostalgic recollection of past or vanished sounds, often idealized or of special significance. Although new sounds may initially be experienced as sound phobias, past or disappearing sounds are often elevated to the status of “sonic romances” in memory. These sounds, which may have seemed irrelevant at the time, can later trigger strong emotional recollections, especially those experienced in childhood, which often transform into cherished memories in adulthood.

Geographical imagination allows us to discern order within the earth’s apparent disorder, assigning meaning to the signs we encounter and incorporating them into the communicative network that is the world. This requires a mindset akin to that of the fool—a willingness to view with wonder what common sense considers ordinary (Raffestin, 2012). The geographer must embody this disposition, discovering meanings and patterns in things that everyone else takes for granted.

As Bruno Munari reminds us, if we want a child to become a person capable of imagination, we must ensure they are exposed to as many different elements as possible. Geography, with its connective tissue of imagination, plays a powerful role in this process. While imagination sees, fantasy, invention, and creativity think. This interaction prompts us to explore, to build bridges between what is known and what is unknown, and to be open to discovery, even in the everyday.

Sonic signals are easily lost in the broad-band background noise of our environment. As Schafer (1985) observed, “the most common sounds need to be amplified to be heard.” This cacophony creates a masking effect, making it difficult to distinguish individual sounds and depriving us of the clarity that once allowed us to grasp vital auditory cues.

The Sound Walk, a multidimensional practice, intertwines the simple act of walking with the active listening of the surrounding environment. This creates a sensory and cognitive experience that allows us to explore the landscape in depth. A sound walk is not merely spatial exploration; it transforms into an auditory journey, where sounds emerge as central characters, revealing hidden aspects of the territory. The slow pace of walking fosters a direct relationship with the place, making listening to an intentional practice that helps us capture details that might otherwise go unnoticed or unheard.

As Schafer emphasizes, each place has its own “tonic sound,” a constant acoustic background that accompanies everyday life. Sounds like the wind, water, or birdsong, typical of

natural environments, are distinctive elements of the landscape, so familiar that they often go unnoticed. Alongside them are the “signals,” sounds that stand out from the background and are consciously perceived, such as the noise of a train or the ringing of church bells, or unique or ritual sounds that hold strong symbolic and communal value, like the call to prayer from the muezzin in Arab communities.

The sound walks fit within this theoretical framework as a tool for critical landscape exploration, rediscovering the potential of sound as a key to understanding space. Walking itself becomes a “slow” gesture that fosters a deeper connection with the environment. The act of walking, beyond being a form of physical exploration, offers an opportunity to tune into the sounds of the landscape, revealing an often-invisible auditory fabric that enriches the territory.

In this context, walking and listening become tools for discovering not only the visible aspects of the landscape but also its hidden acoustic dimensions, transforming our understanding of space and place.

Final considerations

The exploration of the soundscape as a learning environment represents a significant innovation in the field of geography and education. This study has demonstrated how mindful listening to the sounds that surround us can transform our relationship with territory, fostering multisensory learning that goes beyond a purely visual approach. Integrating sound into the construction of a sense of place offers an opportunity to develop a deeper understanding of the spatial and cultural dynamics that define territories, promoting active interaction with the surrounding environment.

The concept of **geographical facts**, in its essence, concerns the observation and interpretation of the physical and cultural manifestations that characterize a territory. These facts can be tangible, such as the terrain’s topography, or intangible, such as the sounds that inhabit it. Sound maps offer an innovative tool for representing these geographical facts, surpassing the traditional visual dimension of maps. Through the recording and organization of a location’s sounds, sound maps enable the exploration of the acoustic nuances of a territory, providing insights into its environmental, social, and cultural dynamics. Sound crystallizes the interaction between people and their environment, contributing to the creation of a unique territorial identity.

The concept of **geographical becoming** is directly connected to the research project “The Distant Noise,” in which the train, often perceived as merely a means of transportation, becomes a central element in constructing invisible geographies. The sound of the train, a soundmark of the Canton of Ticino, is not just noise; it is a moving narrative that transforms space into place. Geographical becoming occurs precisely through mindful listening to these sounds, which stimulates a critical interaction with the territory. In this process, the soundscape not only reflects the physical and social dynamics of the place but also serves as a catalyst for collective memory and identity narration.

Lastly, the **sense of place** emerges clearly in the practice of the sound walk, where the act of walking intertwines with active listening to the surrounding environment. The sound

walks, beyond being a spatial exploration, become a sensory experience that deeply engages the individual. By walking slowly and listening to the sounds of the landscape, participants are invited to rediscover the territory through a continuous dialogue between sounds, spaces, and meanings. In this context, meaning is not pre-defined but is progressively constructed through the subjective experience of listening, which allows one to give form and value to what would otherwise go unnoticed.

In conclusion, the analysis of soundscapes offers a new perspective on geographical learning. This perspective integrates the various sensory and emotional languages of territory, fostering a deeper and more inclusive understanding of the world around us. In this context, soundscapes become a means of valuing both individual and collective experiences, promoting emotional and cognitive engagement in the exploration of territory. This interdisciplinary approach opens new pathways in geography education, encouraging us to view landscapes as complex and multisensory realities where sounds, images, and emotions intertwine to create a richer and more inclusive learning experience.

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