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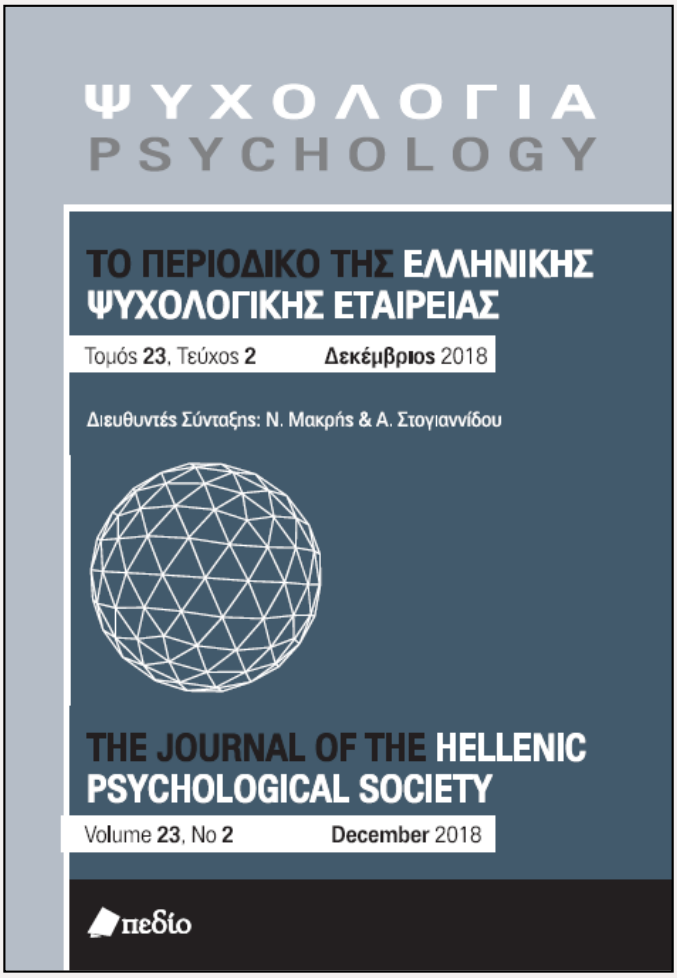

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Localizing emotions: Soundscape representations through Smartphone Use

Angeliki Gazi[1], Charalampos Rizopoulos[2], Yiannis Christidis[3]

ABSTRACT

The term "soundscape" refers to a well-defined field that acts as a source of auditory stimuli and whose characteristics are directly related to the listener's position. The study of soundscapes entails the study of the interplay between the listener and sound, as well as the attribution of representation to auditory information. The investigation of representation is intimately related to the person and emotions, as well as the spatial and auditory aspects of the environment. Emotion is a way of understanding the listeners, their experiences, and the environment. The research described in this paper aimed to identify and investigate the representation of the soundscape through emotional response. The research took place in the city of Limassol, Cyprus. The participants consisted of four groups of 10-15 persons each. A mixed methodological approach was followed – both quantitative and qualitative methods were employed.

For the geolocation of the emotional responses that arise as a result of the representation of the urban soundscape in question, a mobile app was developed for the mediated experience; it runs on on Android, it is titled Locomotion, and it provides participants with the ability to indicate their emotional state based on the dimensions of Russell's (2003) circumplex model of affect. The emotion-related information provided by the participants is overlaid on a map of the city, so that the emotional significance of various units of the urban environment is readily visible.

Key words: soundscape representations, emotions, smartphones, mediated experience applications, hybrid place

Introduction

Discourse on the usage of mobile phones and GPS as a means of representing the urban soundscape is quite recent. The research described in this paper, focusing on the representation of the soundscape of the city of Limassol, Cyprus, and similar investigations, is intended to incite a discussion on the ways psychological and social aspects of interpersonal communication are mediated by the combination of physical and digital communication environments – the latter also incorporating network elements, in a wider context of listening. Novel, hybrid forms of communication environments arise as a result of conver-

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gence practices and tendencies that lead to an interactive, dynamic system of communication entailing the redefinition of individuals and their relationships with others and the environment. Especially when the sound environment becomes the focal point, the dynamics between itself and the emotional activity of the listener/mobile user can trigger distinctive interactions, which would embed core characteristics of the previous elements. In a sense, "the space occupied by mobile users is no longer physical or virtual but hybrid" (Paraguai, 2011, p. 205).

The connection between sound and the experience of place is already thoroughly investigated (DeNora, 2000; LaBelle, 2010; Wissman, 2014) and is potentially associated with the listener's actions at every moment. The representation of the soundscape of Limassol through the participants' emotional responses, in conjunction with the simultaneous usage of mobile phones, raises issues pertaining to the proper understanding of the individual's relationship with space, as many mobile phone scholars (e.g. Firmino, Duarte, & Ultramari, 2011; Rieser, 2004) have focused on the ways mobile phones transform our perception and experience of place.

The investigation described in this paper highlights the way in which the use of a platform that supports mediated communication (*Locomotion*) can function as a tool to aid the understanding of the individual's relationship with the soundscape, and with specific spots and areas of the city in particular.

Soundscapes

McLuhan (1964) has significantly discoursed sound and the media; on the other hand, Schafer (1977) and Truax (1984) have approached the acoustic communicational and ecological dimension of sound, leading the research around what they introduced as "soundscape".

Soundscape Studies is an approach towards the sound of the environment, and Schafer (1977) was the one who coined the word "soundscape" to describe it. He also approached the categories of soundscapes applying characteristics according to the time and place they were occurring: the natural and the urban soundscape are categories based on different theoretical and epistemological foundations, as their properties vary. Also, there has been a separation in the quality of the industrial soundscape which has transformed into the electric soundscape, through time; such issues are studied by acoustic ecology. However, the overall purpose of acoustic ecology received additional confirmation recently, when Schafer (2012, p. 52) reminded the meaning of it: *"speaking out against destructive and unnecessary noise. It means saving our ears and those of others who might not realize that sound can be dangerous"*, Truax (1999) defines acoustic ecology as the study of the representations of the acoustic environment, or soundscape, on the physical responses or behavioural characteristics of those living within it. Its particular aim is to draw attention to imbalances which may have unhealthy or inimical effects. Discussing the definition of acoustic ecology, Carter (2004, p. 60) suggests asking ourselves "*not only what we are hearing, but what are we listening for?*"

Throughout the years, soundscape has been used to describe practically any "*sound environment, either in the natural world or in any recorded medium*" (Cox & Warner, 2009, p. 415). As "*Acoustic Ecology provides a model for the blurring of conceptual boundaries that separate the traditional Western domains of inquiry into the categories of science, social science, and humanities*" (Epstein, 2003, p. 3), its interdisciplinary character renders itself ideally as the foundation of this research.

The term 'soundscape representation' refers to a complex, multidimensional concept that involves aspects pertaining to space, place, and emotion (Truax, 1999). From a geographical standpoint, the listener, being

situated at the centre of auditory communication, creates a representation of the environment that is based on emotional responses to it. *"The soundscape is the sonic environment which surrounds the sentient. The hearer, or listener, is at the center of the soundscape... It is a context, it surrounds and it generally consists of many sounds coming from different directions and of different characteristics" (Rodaway, 1994, p. 86). The current research focuses on representations of the soundscape by means of an emotion-centred approach.*

In studying the connection between what people hear and their response to this experience, Bull (2000) and DeNora (2000) have stressed the way listeners create their own soundscape through personal music devices to maintain emotions and obtain memories when in the street. But also everyday sound itself appears to be able to incite an emotional response. Pugmire (2005) refers to the sound of the bell and its ability to create emotions with its distinctive hue, while Stocker (2013) explores the sound and emotional boundaries, discussing the classic research by Schafer and Truax in the 70s. It was in the first half of the previous century that people realised traffic noise would cause fatigue and anger to the listeners (Brown, Dennis, Henry, & Pendray, 1930) and till now, recent studies (Moscoso, Peck, & Eldridge, 2018) still stress the direct connection between natural and industrial sounds to emotional activity of the listener exposed to them.

Emotions, Space and Place

The definitions and thoughts about emotions with respect to the media were described by McLuhan (1964); however, with a thorough and comparative study by more contemporary academics, many important elements of his theory are applied in everyday life. The following example cited by McLuhan's helps us to understand the importance of using (the power of) sound as a sensation, regarding an everyday life activity: "*Battle shock created by violent noise has been adapted for dental use in the device known as audiac. The patient puts on headphones and turns a dial raising the noise level to the point that he feels no pain from the drill"* (McLuhan, 1964, p. 44). The power of sound and its direct association with emotions in this example is prominent.

Our emotional response towards what we hear is expressed in various aspects of our everyday experience. In real life situations designers take acoustics into a major account every time they design a building. Churches with large domes are constructed to incite awe to the visitor, as sound elements get impressively and uniquely amplified in the reverberated space. The acoustics of Turkish baths contribute to an emotional stimulation, while in everyday life, it is proven that "the driver's emotional experience of quality car sound ... would help to sell a car" (Cleophas & Bijsterveld, 2012, p. 120). A complex connection between sounds and emotions is evident here: triggering a particular sound, or even everyday sound elements, can elicit emotional reactions from the listener, who inevitably participates in this communication model. Kang, who has attributed dynamic, realistic and emotion-rich elements to sound representation, declared with conviction that "people are often ... soothed by certain natural sounds such as from water and leaves" (Kang, 2007, p. 48).

Already, the importance of the experience of everyday urban sound has been stressed (Bijsterveld & Dijck, 2009); what has also been expanded upon is the perceived necessity of connecting places to a particular sonic experience. This would also include the elements people choose to listen in a contemporary urban environment: "*when there are several different streams of sound emanating from different locations around us, the traffic outside, the hum of the computer on the desk, the conversation in the room next door, we do not appear to be able to listen to them all at once*" (Styles, 2006, p. 6). What this demonstrates is

our ability to focus on everyday sound, and in a next level, to represent the soundscape via emotions on it, potentially connecting it with the place it resonates.

Often, the terms "space" and "place" are used interchangeably; however, they refer to different aspects of the environment. "Space" refers to the objectively perceptible characteristics of the environment, i.e. the physical dimension (e.g. size, texture, geometry, color, etc.). "Place", on the other hand, is used to refer to the subjective value with which space is imbued – in a sense, the subjective interpretations of space and its characteristics. The primary ingredient of the concept of place (and a necessary condition for it to occur in the first place) is an emotional bond between the listener and the environment in relation with the listener's representations, self-concept, and identity, in addition to socioculturally determined factors – e.g. social groups and formations of which the subject is part.

Given that space and place are terms directly related to geography, and that sound appears as an evolving medium of connecting people with place, both history and ethnology have converged to place sound in a geographical context (Coates, 2005). Rodaway (1994) explored sound as sense combined in such a context too, emphasizing the importance of geography and insisting on the sense of place. Recently, Wissman (2014) published an approach to urban sound based on geographies, where, among others, he stressed the tight emotional relations urban people develop with the sound of their place.

Although the investigation of sound from a geographical perspective might not be new, new perspectives continuously evolve, placing the geography of sound in contemporary academic research. Consequently, local sound attributes are represented differently by listeners.

Studying the experience in the city, and focusing on urban sound, emotions and the place forms a potential basis for studying representations, on the way to understand a listener's experience. Based on the above, it is evident that the soundscape is an important source of information through which the listener makes sense of emotional involvement with places and represents of the world and through which places are emotionally represented.

Hybrid place among technology and soundscape representations

The investigation described in this paper explores the representation of the soundscape via locating the listener's emotions in the context of a mobile annotation. The individuals' emotional response to the soundscape of the city is "anchored" to the exact location of the urban environment in which it occurs by means of an Android application that allows participants to indicate the quality of their emotional state along the dimensions of Russell's circumplex model of affect – namely, valence and arousal.

In the context of the research outlined in this paper and the mediated experience it entails, the Android app titled *Locomotion* (developed for this purpose) provides access to information pertaining to the qualities of various sonic urban locations, as indicated by the participants themselves. An overlay is displayed on top of the map of the city, thus giving a glimpse to the way soundscapes are represented (from an emotional standpoint) by other participants of the application. At the same time, however, the act of disclosing the representation of a soundscape to the person facilitates and accelerates its attainment of place status. Furthermore, the person is given a notion of control in the sense that he/she can actively represent the soundscape (even though the influence of this representation is dependent on the number of other representations entered at that soundscape by other listeners/users).

It is noteworthy that the mobile device mediates the person's experience of the soundscape and location, in a sense creating a hybrid space that lies at the intersection of the physical environment and digital information. It is therefore conceivable that, by combining aspects of physical and virtual spaces, hybrid spaces can take advantage of the place-defining characteristics of both their constituent elements at the same time. Although direct communication among users is currently not supported by the mediated experience app, other users are still present, indicating their emotional response to the soundscape.

Research Questions

The research outlined in this paper is ongoing and is guided by the following research questions.

1. How are soundscapes represented during the process of locating emotion – i.e. associating emotion with specific geographic locations?
2. Which urban sounds are represented as positive and which soundscapes are experienced as negative?
3. Following from the previous question, how is the representation of a soundscape formulated and in what way are the emotions experienced during exposure to the soundscape?

Description of the *Locomotion* Android mediated experience application

The application was developed as a self-report tool that allows persons to indicate their emotional responses at any given time, thus contributing to the formation of a collective emotional representation of the sound-

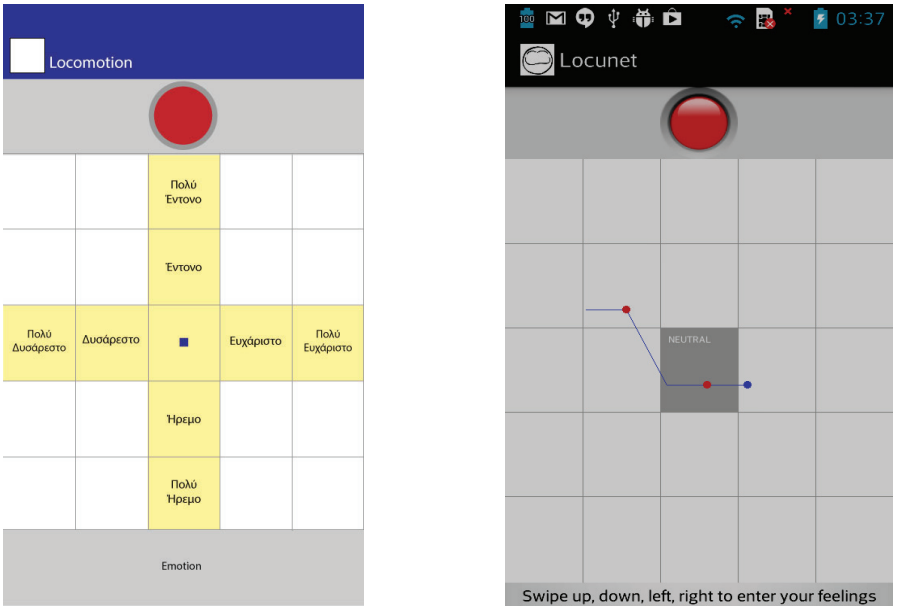

Figure 1: Left: a design mockup of the two axes of Russell's circumplex model of affect in the Locomotion Android application. Right: A screenshot from the Android application. The blue dot represents the person's current position. The red dots indicate spots in which the person has provided a subjective representation of the soundscape by means of reporting this/her emotional response.

scape. Russell's (2003) "circumplex model of affect" is used for the representation of soundscape via emotions. According to this model, representations of the environment (and of soundscapes in this particular instance) can be described in terms of two main dimensions, emotional arousal (general level of activation) and emotional valence (an information of the soundscape as desirable or not). In the application, each dimension was treated as a 5-point semantic differential. For emotional valence, the labels were, in ascending order, "very unpleasant", "unpleasant", "neutral", "pleasant", and "very pleasant". For emotional arousal, the labels were "very calm", "calm", "neutral", "arousing", and "very arousing". These two dimensions formed a 5´5 matrix, as shown in figure 1.

The horizontal axis represented emotional valence, whereas the vertical axis represented arousal. The participants selected the cell that more closely corresponded to the emotional state they experienced. They moved the active cell in the desired direction by sliding their finger across the screen, e.g. from left to right to indicate a pleasant emotional response and from top to bottom to indicate a calm emotional response When certain of their choice, users long-press on the screen to store their emotional response at their location (and within the soundscape associated with that location).

Methodology

A mixed methods approach was used so as to provide a wide coverage of the processes of the representation of the soundscape of the city of Limassol, Cyprus, via the use of mobile devices. The total number of participants was 30 (17 male and 12 female, one missing value); all were undergraduate or postgraduate students of the Department of Communication and Internet Studies of Cyprus University of Technology. All were residents of Limassol and familiar with the local sound attributes, as well as with the city's downtown locations. The mean age of the participants was 23.32 years (s.d. = 3.55 years).

All users participated in a soundwalk through the city. The route was planned so as to expose participants to a variety of soundscapes.

Soundwalking is a method of delving into the environment's soundscapes. This method which was introduced by Westerkamp (1974) and widely used since the 1970's, concerns a way of exploring and representing the surrounding acoustic space by careful listening to the everyday sounds while walking. Westerkamp (1974, p. 19) stressed that "*the first soundwalk can be done anywhere, at any time, and as often as desired. For the sake of intensity it may be wise to limit the walk initially to a small area or even to one particular spot*". These guidelines can be implemented in a real space and transformed according to the needs dictated by the research questions above. Nowadays, the soundwalk has evolved into a methodological tool with numerous variations, during which the tracing of the details of the listening representation is prioritized. Soundwalkers walk in the city without talking, but only listening to the sounds around them. As a methodological tool, it potentially reveals a lot of information about the surrounding acoustic environment, information that always has been there, but often hardly noticed. That would agree with LaBelle's conception of soundwalking as "*an active and rich base for enlivening acoustical understanding and representation"* (LaBelle, 2010, p. 104). Along the route, persons stopped at six specific points, at which providing an emotional response was mandatory. Additionally, participants were free to provide information on their emotional response at any other point along the route. The entire process lasted four days, with an average number of ten participants per day. These specific listening locations were chosen due to the fact that they demonstrated

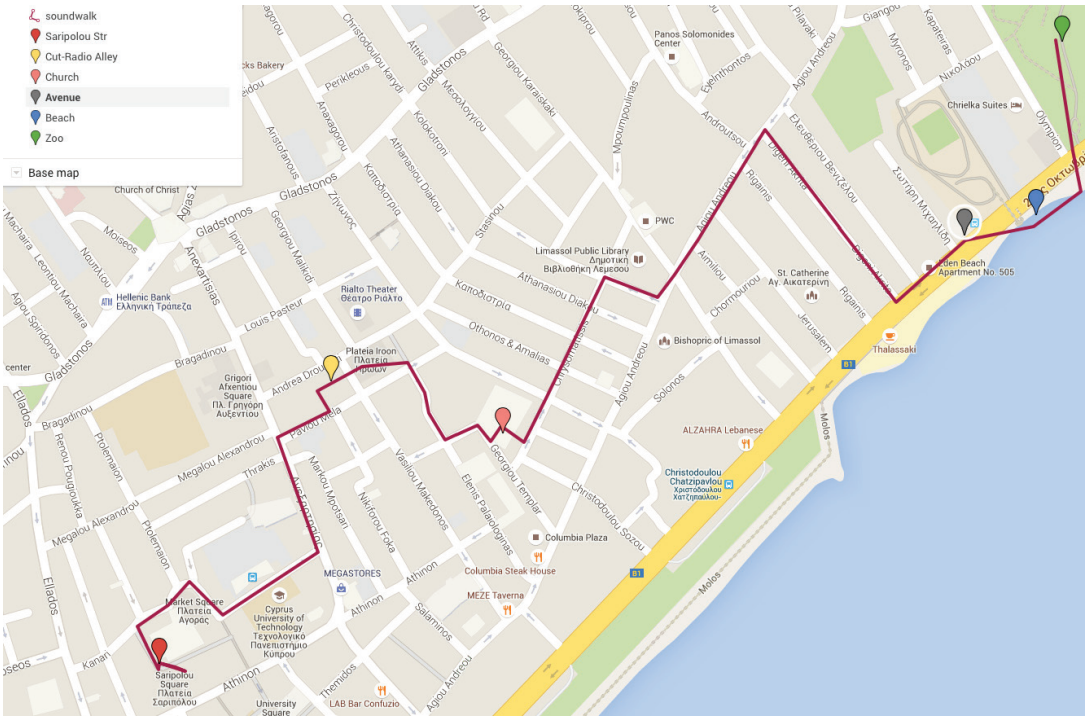

Figure 2: A map of the route used for the soundwalk.

certain acoustic properties which would facilitate the exploration of the aforementioned research questions. Specifically, the emotions triggered by sounds which could be identified as noisy or not, have been the focus on the criteria when defining the six spots.

In particular:

1. The first listening point (the zoo of the city of Limassol) offers a quiet soundscape where traffic sounds get filtered by the trees, and dominant sounds are mostly human and nature oriented.
2. In the cityscape, and when very close to the seashore, one can deliberately focus on a sonic experience. This particular listening point is noteworthy due to the fact that the sound of the sea is audible in tandem with the sound of nearby traffic.
3. In the third selected area, the sound of the cars passing by on four lanes is dominant. The area is noisy, and the specific spot can be characterized as noisy as well.
4. The courtyard of a church in the area is a big, open space: the aural architecture allows the sound to circulate and mix along with the sound of the trees and birdsong. Due to the peculiarity of the neighborhood, the sound acquires quiet properties.
5. Cut-Radio Alley is a narrow, covered walkway which acquires reverberation attributes. Due to its small size, every resonating sound in there is particularly amplified in space before reaching the ears of the walker.
6. Saripolou Square is a downtown area full of bars, which can get noisy during the night. In daytime, though, there is always the sound of preparing for the coming night: the sound of moving tables, stools or cleaning the bars is dominant.

Figure 4: The seashore

Figure 5: The pavement next to the motorway (left) and the church (right)

Figure 6: CUT Radio underpass

Figure 7: Saripolou street

After the soundwalk, participants filled the SUS questionnaire and three subscales of the USE-Q questionnaire, namely "Ease of Use", "Ease of Learning", and "Satisfaction". These measures provide an indication of the User Experience (UX) of the *Locomotion* application.

Subsequently, the focus group was held so as to highlight aspects of the experience not covered by the questionnaire and to provide a more in-depth look on aspects of the research questions that cannot be covered by a representation of the soundscape as recorded through the use of smartphones.

Results

Location seems to significantly affect emotional response to sounds, as ascertained through Friedman's rank sum test: $\chi^2(5)$ =

Table 1
Means and standard deviations of the participants' evaluation of their emotional state at the six locations along the soundwalk route.

	Arousal		***Valence***	
Location	*Mean*	*s.d.*	*Mean*	*s.d.*
1 – Zoo	2.83	0.648	3.47	0.571
2 – Seashore	2.83	0.986	3.63	0.850
3 – Motorway	3.50	0.820	2.43	0.679
4 – Church	2.67	1.028	3.27	0.740
5 – CUT Radio alley	3.10	0.662	2.93	0.640
6 – Busy Square	3.13	0.681	3.23	0.728

59.25, $p < 0.001$. For pairwise comparisons, the exact test suggested by Eisinga, Heskes, Pelzer, & te Grotenhuis (2017) was performed, as implemented in the R package *PMCMRPlus*.[3]

According to the results, the pairs of locations for which the difference in emotional response was statistically significant are: (i) Motorway and Zoo ($p < 0.001$), (ii) Motorway and Seashore ($p < 0.001$), (iii) Motorway and Church ($p = 0.004$), (iv) Zoo and CUT Radio alley ($p = 0.047$), and (v) Motorway and Busy Square ($p = 0.035$).

The above results, combined with the mean values for each location as presented in Table 1, indicate that the locations which featured either noise (the motorway) or soundscapes whose origin could not be ascertained were represented as negative (valence < 3.00). In both these cases, the comparatively low emotional valence was accompanied by comparatively high emotional arousal ratings, possibly indicating undesirable overstimulation. On the contrary, locations that featured audible in tandem with the sounds of nearby traffic (e.g. the beach), non-existent or low-intensity sound (as in the case of the church), represented as quiet soundscape (e.g. the zoo), or sounds associated with significant social activity (as in the busy square) resulted in positive representations (valence > 3.00). In these cases, the emotional arousal was not as uniform: a higher-than-average arousal at the busy square was not perceived as negative, probably due to its occurrence being attributable to social activity (which is generally desirable).

The aforementioned data, in combination with the focus groups (selected extracts of which are provided below), seem to be in accordance with Murray Schafer's theory, according to which noise originating from the environment can mediate (and negatively affect) the representation of the soundscape. Furthermore, it is evident that negative emotional responses can be attributed to specific sounds and their characteristics, especially those considered as "noise".

Extract #28: *The third stop, we were right in the middle of the motorway*.

Extract #29: *You could only hear cars passing through, we couldn't hear anything else.*

Extract #30: *One noise that stuck in my mind, that made an impression on me, was that of a motorcycle in a small alley.*

3. https://cran.r-project.org/web/packages/PMCMRplus/index.html

Extract #31: *The alarm sound of a car.*

Extract #32: *Car horn sounds.*

Extract #33: *In one of the pedestrian crossings, someone in a car, with lowered windows and very loud music, which I personally didn't like, so I registered an unpleasant [emotion] there.*

The soundscapes that were represented as positive contain sounds such as waves, birdsong, and the motion of leaves. As evident from the above research the soundscapes that represented as positive emotions tended to belong to the category of natural sounds.

Extract #35: *The sea; it is something I personally like... because it had this slight wave, and that's what I liked a lot.*

Extract #36: *The fountain.*

Extract #37: *Well, the sea, it was very nice, and there, at the church, where it was quiet.*

Extract #38: *Besides the sea, as the others said, I also liked the various birds we heard [singing] along the route.*

Extract #39: *I would say the route to the church. The little alley leading to the church... Because there was a breeze and you could hear the leaves rustling.*

The sounds that elicited an "intense" or "very intense" emotion were identical to those that caused negative emotional responses. Also, emotional arousal was caused as a result of the sudden onset of certain unexpected sounds, as well as sounds of inherent high intensity which tended to cover other sounds of lower intensity.

Unexpected sounds are defined by Schafer (1977) as sounds that detract from the "purity" and clarity of the representation of the soundscape.

Extract #41: *When the vehicles honked and sped up, that was irritating.*

Extract #42: *Basically, in places where there was too much traffic, the sounds [produced] were very intense [implying that these sounds elicited negative emotional responses].*

Extract #43: *At times, intense sounds can occlude other sounds you may wish to hear; therefore, it was bothersome.*

Regarding the representation of the soundscape when associating emotion with specific geographic locations, it seems that specific spaces can acquire place status when their soundscapes lead to positive emotional responses. More specifically, for each of the six locations in total:

Zoo

The participants remained for a short time near the entrance to the zoo, in front of a fountain. The sound that was prevalent at that location was that of running water; additionally, the sound of motor traffic from the street adjacent to the zoo was also audible, albeit at a low volume due to distance.

Extract #21: *The zoo is a soundscape in which I could stay for hours. It is a place that made me experience positive emotions... mainly the water from the fountain.*

Extract #17: *Because I am from Limassol, I frequently pass through the zoo, it's the first time I realized that the reason I love this place is its calm soundscape, and the serenity it induces.*

Extract #9: *I would prefer noises from the street not to interrupt the soundscape, but it was a place I didn't want to leave.*

It can be suggested that it is this particular location in the zoo is invested with qualities that pertain to the concept of place, as described above. According to Tuan (1996, p 451-2), "*place is giving rise to affective attachments in which people are emotionally bound to their material environment*".

Seafront

The sound of the sea (and waves in particular) prevailed; such a sound is of natural origin. Overall, this is once again indicative of the fact that natural sounds often represented as pleasant emotions. Additionally, the sound-

scape included distant sounds of motor traffic, which tended to detract from the overall pleasantness of that particular location.

Extract #7: *It was calm by the sea. But you had to go near the water and listen to the wave.*

Extract #11: *The noise from the motors disturbed me, but I am used to hearing such sounds at the beach. And I've trained myself to listen to the sea and not motor traffic noise.*

Extract #25: *I'd prefer to only hear the sound of the sea. It would be even calmer. But in Limassol that's how the sea sounds: mixed with noise from the street. [...] The noise by the sea throws me off; However, I am used to it.*

A recurrent theme is that of natural sounds being combined with noises originating from the city. However, the fact that the participants are residents of Limassol, and thus already familiar with the city's soundscape, seems to lead to the formation of place attachment centred on that particular soundscape; this attachment focuses on the positive emotions elicited by natural sounds and the ability to disregard noise, which leads to negative emotional states.

Motorway

The third stop along the route of the soundwalk was on the sidewalk of a motorway busy with traffic. The emotions generated by the soundscape at this location were highly intense and negative. Due to the time of the day, the flow of the traffic was heavy, and the soundscape consisted primarily of engine, braking, or car horn sounds. As the participants reported during the focus groups, such sounds gave rise to overly negative emotional responses of high arousal, a fact that was also confirmed by the analysis of the quantitative data (presented earlier). This is in stark contrast to most other locations, in which a pleasant emotional state was associated with either a soundscape of an altogether low intensity, or natural sounds.

Extract #30: *The worst soundscape was that of the motor traffic.*

Extract #14: *I wanted to leave that place. To pass through there quickly.*

Extract #20: *I relaxed when we left there and turned towards the alley that was calm.*

The relationship between emotion and place is as necessary as it is complex; a location cannot attain place status unless it is of significance to the person. The soundscape of the motorway is represented as a negative emotional state, which points to the fact that, although consistent with the concept of place meaning and identity, the relationship between the individual and that place cannot be considered "attachment" on account of the lack of positive emotions, a lack which precludes the formation of an affective bond.

Church

At the site of the church the prevailing silence caused positive emotions and serenity.

Extract #22: *There was calmness; you could only hear birdsong from the trees.*

Extract #17: *The church is not a place I feel connected to. However, I realized how much it relaxed me following exposure to the noise of the city.*

Extract #13: *Perhaps that is why churches are quiet: to be hospitable. I hadn't thought about that. Maybe I will go there again when I need to calm down.*

As mentioned above, the calmness that dominates the soundscape of the church and the positive emotional states described by the participants can lead to the transformation of the church to a place and, subsequently, the appearance of place attachment through the formation of an emotional bond between the individual and that place.

CUT Radio underpass

At this particular location, partly due to the spatial layout, sound tends to be absorbed, and are heard very faintly as a result. It may

be surmised from the results that the dominant choice was that of neutral affect due to the aforementioned lack of sound.

Extract #3: *Blank. No emotion.*

Extract #9: *Boring...*

Extract #10: *It was a soundscape that didn't bother me if I stayed, but I wanted to leave because there was nothing special there for me.*

It can be argued that this particular soundscape leads to a state of placelessness; persons exposed to that soundscape do not experience any particular emotion. According to Augé (2012, p.83), "placelessness (or a "non place") is something that is only there to be passed through".

Saripolou str.

The dominant choice at this spot was that of emotional arousal due to the audible music that was originating from the cafés and the talk of the patrons. The social activity and the resulting representations associated with that particular place led to positive emotional responses. Thus, the soundscape did not consist of noise, but of sounds that, despite being high in intensity, hinted at pleasant activities; furthermore, the cause of the sounds that dominated the soundscape was other human beings, and not mechanical or electronic devices.

Extract #11: *OK, there was music I didn't like, but there was also conversation among people who had drinks, it was pleasant.*

Extract #18: *I also wanted to have a coffee and sit there without talking so as to listen to the sounds of other people talking, to take a rest after this walk we had had. It was the best place to rest.*

Extract #21: *There were some people there, not too many; as much as needed, that's why it was so rejuvenating. There were other people there.*

Some soundscapes are special because they are the sites of pleasant or unpleasant memories; other soundscapes represent important sociocultural practices, whether formal and ritualized or informal and spontaneous (e.g. a popular meeting place).

Towards soundscape emotional geographies

It can be concluded from the discussion above that the representation of the soundscape – and its subsequent emotional responses – as "pleasant" or "unpleasant" is largely consistent with the distinction between "natural sound" and "noise", the latter referring to sounds with negative representations and/or of high intensity. Natural sounds (e.g. waves, flowing water, wind, etc.) tend to be associated with more pleasant emotional responses, in accordance with the theory of soundscape, as laid out in this paper, and based on which "speaking out against destructive and unnecessary noise it means saving our ears and those of others who might not realize that sound can be dangerous" (Schafer, 1977).

Soundscapes can initiate the recall of representations and the associated emotional bond, which include or can lead to a sense of attachment and belonging to a place. Specific soundscape characteristics highlight certain emotional responses that create a key set of relations through which individuals become connected with a place. This is quite evident in the case of the areas associated with positive emotions; a positive emotional response is the most common psychological phenomenon leading to the transformation of spaces to places and the occurrence of place attachment. This was particularly obvious in places that are associated with important sociocultural practices, namely the busy street full of cafés and restaurants.

Regarding the particular set of data presented in this paper, it is noteworthy that, in areas #1 and #2 (the zoo and the seashore,

respectively), the degree of pleasure experienced is reduced due to the "encroachment" of noise from adjacent areas (in both cases, a motorway). Still, the reported valence for these two areas was the highest in the entire soundwalk (3.47 and 3.63 for the zoo and the seashore, respectively). The fact that the participants had already been familiar with the place, as they live in Limassol, has to be taken into account. In other words, existing emotional bonds should be considered before interpreting the results. Accordingly, and as the soundwalk was implemented in groups, social bonds between the members of the group were also present during the listening and the responses.

The existing soundscape, as seen in the case of the listening spots mentioned above, appears to be causing negative emotional responses when consisting mainly of noise, and positive ones when consisting primarily of silence. However, the particular case of the city of Limassol interestingly shows that, contrary to what one might expect, at the spots of the zoo and the seashore, the degree of pleasure in the participants' emotional responses is not as high. This can be partially explained by the fact that both places are exposed to traffic sounds due to their proximity to the main road. The sound of the traffic is not reduced; a partial masking by the sound of the sea takes place at the seashore, while a small cut out happens at the zoo. In both cases however, the listeners' emotions are apparently influenced by their attentional focus. Also, the fact that the participants live in cities, and are exposed to city sounds on a daily basis has to be taken into account: even when very close to the seashore, urban citizens may not be able to easily filter out the traffic noise, as this is next to him/her – it would appear that everyday involvement with an environment and its soundscape fosters a connection between the individual and the place in question. This seems contrary to theoretical approaches that rely on the concept of adaptation to repeated environmental stimuli (Bell, Greene, Fisher, & Baum, 1996; Cassidy, 1997; Evans & Cohen, 1987). If one were to adopt this view, one would expect city dwellers to be habituated – at least to some degree – to usual city noises such as motor traffic. It would appear that, in addition to extending the user's ties with a particular locale by providing more opportunities for forming connections with it and its elements, including the persons found in them, location-aware systems that provide users with the ability to self-report their emotional state could highlight the disparities inherent in soundscapes as experienced in urban environments. As seen above, this disparity is also reflected in the internal representation of the urban soundscape and the users' emotional response to it.

Based on the above, one can surmise that specific soundscapes can give rise to emotional geographies based on which the individuals that constitute them are interconnected owing to emotional bonds that originate in the perception of auditory cues.

By employing mobile applications in the context of mediated experiences as interfaces that allow persons to "attach" information to places and retrieve location-based information, space is no more determined solely by physical contiguity; according to Castells (1996), it is the "space of flux", a circulation space not any more restricted to geographical frontiers. Applications that mediate the experience of environments and/or soundscapes can readily contribute to highlighting the evolving meaning of locations (Souza de e Silva & Frith, 2012), as well as the ways in which persons represent these locations, assign emotional meaning to them, experience them, and act in them in the context of everyday life – in other words, the transformation of urban "space" to "place".

References

Augé, M. (2009). Non – places: *An introduction to supermodernity*. London:Verso.

Bell, P.A., Greene, T.G., Fisher, J.D., & Baum, A. (1996). *Environmental psychology* (4th edition). Orlando, FL: Harcourt Brace.

Bijsterveld, K., & v. Dijck, J. (2009). *Sound souvenirs: Audio technologies. memory and cultural practices.* Amsterdam: Amsterdam University Press.

Brown, E. F., Dennis Jr., E. B., Henry, J., & Pendray G. E. (1930): *City Noise: A Report of the Commission Appointed by Dr. Shirley W. Wynne, Commissioner of Health, to Study Noise in New York City and to Develop Means of Abating It.* New York: Department of Health.

Bull, M. (2000). *Sounding out the city: Personal stereos and the management of everyday life*. Oxford: Berg.

Carter, P. (2004). Ambiguous traces, mishearing, and auditory space. In V. Erlman (ed.), *Hearing cultures, essays on sound, listening and modernity* (pp. 43-63). New York: Berg.

Cassidy, T. (1997). *Environmental psychology: Behaviour and experience in context*. Hove and New York: Psychology Press.

Castells, M. (1996). *The rise of the network society*. Malden, MA: Blackwell.

Cleophas, E., & Bijsterveld, K. (2012). Selling sound: Testing, designing, and marketing sound in the European car industry. In T. Pinch & K.K. Bijstervelds (Eds.), *The Oxford handbook of sound studies* (pp. 102-126): Oxford University Press

Coates, P. (2005). The strange stillness of the past: Toward an environmental history of sound and noise. *Environmental History, 10*(4), 636-65.

Cox, C., & Warner, D. (2009). *Audio culture readings in modern music.* New York: Continuum.

DeNora, T. (2000). *Music in everyday life*. Cambridge: Cambridge University Press.

Eisinga, R, Heskes, T. Pelzer, B., & Te Grotenhuis, M. (2017). Exact p-values for pairwise comparison of Friedman rank sums, with application to comparing classifiers. *BMC Bioinformatics*, 18:68. http://doi.org/10.1186/s12859-017-1486-2

Epstein, M. (2003). Growing an interdisciplinary hybrid: The case of acoustic ecology. *History of Intellectual Culture , 3*(1) Retrived from https://www.ucalgary.ca/hic/issues/vol3/9

Evans, G.W., & Cohen, S. (1987). Environmental stress. In D. Stokols & I. Altman (Eds.), *Handbook of environmental psychology* (pp. 571-610). New York: John Wiley & Sons.

Firmino, J.R., Duarte, F., & Ultramari C. (Eds.) (2011). *ICTs for mobile and ubiquitous urban infrastructures: Surveillance, locative media and global networks*. New York: Hershey.

Kang, J. (2007). *Urban sound environment*. New York: Taylor & Francis.

LaBelle, B. (2010). *Acoustic territories sound culture and everyday life.* New York: Continuum.

McLuhan M.(1964). *Understanding media: The extensions of man*. New York: McGraw Hill.

Moscoso P., Peck M. & Eldridge A. (2018). Emotional associations with soundscape reflect human-environment relationships. *Journal of Ecoacoustics*. 2:#YLFJ6Q. https://doi.org/10.22261/JEA.YLFJ6Q

Paraguai, L. (2011). Mobile devices: Designing hybrid body – spaces. In J.R. Firmino, F. Duarte, C. Ultramari (Eds.), *ICTs for mobile and ubiquitous urban infrastructures: Surveillance, locative media and global networks* (pp. 205-220). New York: Hershey.

Pugmire, D. (2005). *Sound Sentiments. Integrity in the Emotions*. Oxford: Oxford University Press.

Rieser, M. (Ed., 2011). *The mobile audience: Media art and mobile technologies*. New York: Rodopi.

Rodaway, P. (1994). Sensuous geographies. London and New York: Routledge.

Russell, J.A. (2003). Core affect and the psychological construction of emotion. *Psychological Review*, *110*, 145-172.

Schafer, R. M., (1977). *The Soundscape: Our Sonic Environment and the Tuning of the World.* Vermont: Destiny Books.

Schafer, R. M. (2012). Soundscape Studies: the early days and the future. Sabine Breitsameter & Claudia Soller-Eckert (eds). Global Composition Conference on Sound, Media and the Environment, pp. 49-54. Darmstadt: Hochschule Darmstadt.

Stocker, M. (2013). *Hear where we are: Sound, ecology, and sense of place.* New York, NY: Springer Science & Business Media.

Styles, E. A. (2006). *The psychology of attention.* Hove & New York: Psychology Press.

Souza de e Silva, A., & Frith, J. (2012). *Mobile interfaces in public spaces: Locational privacy,*

control and urban sociability. New York: Routledge.

Tuan, Y.F. (1996). Space and place: Humanistic perspective. In D.N. Agnew, D.N. Livingstone, & A. Rogers (Eds.), *Human geography: An essential anthology*. Malden, M.A.: Blackwell (Original work published 1974)

Truax, B. (1984). *Acoustic communication*. New Jersey: Alex Publishing Corporation.

Truax, B. (1999). *Handbook for acoustic ecology*. Retrieved from : http://www.sfu.ca/sonic-studio/handbook/Sound_Signal.html.

Westerkamp, H. (1974). Soundwalking. *Sound Heritage, III* (4).

Wissman, T. (2014). *Geographies of urban sound.* Farnham: Ashgate

Εντοπίζοντας τα συναισθήματα: Η αναπαράσταση του ηχοτοπίου μέσω της χρήσης έξυπνων τηλεφώνων

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ΠΕΡΙΛΗΨΗ

Ο όρος «ηχοτοπίο» αναφέρεται σε μια σαφώς οριοθετημένη μονάδα χώρου η οποία λειτουργεί ως πηγή ηχητικών ερεθισμάτων και της οποίας τα χαρακτηριστικά σχετίζονται άμεσα με την τοποθεσία του ακροατή. Η μελέτη των ηχοτοπίων εμπεριέχει τη μελέτη της αλληλεπίδρασης μεταξύ του ακροατή και του ηχητικού ερεθίσματος, καθώς και της απόδοσης αναπαραστατικού νοήματος στην ηχητική πληροφορία. Η διερεύνηση της έννοιας της αναπαράστασης είναι άρρηκτα συνδεδεμένη με το άτομο και τα συναισθήματα που αυτό βιώνει, καθώς και με τις χωρικές και ηχητικές πτυχές του περιβάλλοντος. Το συναίσθημα συνιστά έναν τρόπο κατανόησης των ακροατών, των εμπειριών τους, και του ίδιου περιβάλλοντος. Η έρευνα που περιγράφεται στο παρόν άρθρο είχε ως στόχο την αναγνώριση και τη διερεύνηση της αναπαράστασης του ηχοτοπίου μέσω της συναισθηματικής απόκρισης σε ηχητικά ερεθίσματα.

Η έρευνα έλαβε χώρα στην πόλη της Λεμεσού (Κύπρος). Οι συμμετέχοντες ήταν κατανεμημένοι σε τέσσερις ομάδες, με την κάθε μία εξ αυτών να αποτελείται από 10-15 άτομα. Υιοθετήθηκε μια μικτή μεθοδολογική προσέγγιση αποτελούμενη τόσο από ποσοτικές όσο και ποιοτικές μεθόδους. Προκειμένου να καταστεί δυνατός ο γεωγραφικός εντοπισμός των συναισθηματικών αποκρίσεων που προέκυψαν ως αποτέλεσμα της αναπαράστασης του εν λόγω αστικού ηχοτοπίου, αναπτύχθηκε μια εφαρμογή για κινητά τηλέφωνα Android (με το όνομα Locomotion). Η εφαρμογή δίνει στους συμμετέχοντες τη δυνατότητα να καταδείξουν τη συναισθηματική τους κατάσταση βάσει των διαστάσεων που συνιστούν το κυκλικό μοντέλο συναισθήματος του Russell (2003). Η πληροφορία περί συναισθηματικής απόκρισης την οποία παρείχαν οι συμμετέχοντες μπορεί να αντιπαραβληθεί με τον γεωγραφικό χάρτη της πόλης, ούτως ώστε να καταστεί εμφανής η συναισθηματική διάσταση διαφόρων μονάδων του αστικού περιβάλλοντος.

Λέξεις-κλειδιά: Αναπαραστάσεις ηχοτοπίου, συναισθήματα, κινητά τηλέφωνα, εφαρμογές διαμεσολαβημένης εμπειρίας, υβριδικός χώρος

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