

An Interactive Sonic Environment Derived from
Commuters' Memories of the Soundscape:
A Case Study of the London Underground

A PhD thesis submitted in partial fulfilment of
the requirements for the degree of
DOCTOR OF PHILOSOPHY

Music, Technology and Innovation Research Centre
Faculty of Humanities
DE MONTFORT UNIVERSITY
Leicester, United Kingdom

by

Ximena ALARCON DIAZ

January 2007

Supervisors: Prof. Leigh Landy (MTIRC)
Dr. Brian Brown (Faculty of Health and Applied Social Sciences)

To Gina and Israel

ABSTRACT

Through interrelating the Acoustic Communication concepts of soundscape with contemporary collective memory studies, this research project explores the relationship between commuters and the London Underground (LU) soundscape in order to create an interactive sonic environment on the Internet. The methodology combines fieldwork and artistic work, focusing on commuters' perceptions of time and space, and on their sonic memories, as elements through which to interpret the space. The objective of the fieldwork is to investigate commuters' aural memories of the LU soundscape, including the feelings and sensations that it stimulates. The artistic objective is to facilitate the interaction between the soundscape and its users through an interface that allows a creative combination of sounds to assemble aural memories into a sound-driven multimedia experience.

Twenty-four commuters participated in the ethnographic study during the three phases of the research; they followed the researcher's model, which combines the processes of listening and remembering. The researcher thus developed an interactive sonic environment where commuters can experience a non-linear virtual journey through the soundscape of LU, then apply this as a means of reflecting on the original commuting experience. The interactive nature of the process makes it possible for individual memories to be linked in a creative shared experience; it fosters the development of on-line sound-driven narratives.

TABLE OF CONTENTS

ABSTRACT	i
TABLE OF CONTENTS	ii
LIST OF TABLES	v
LIST OF FIGURES	v
LIST OF APPENDICES	vi
ACKNOWLEDGEMENTS	vii
INTRODUCTION	1
CHAPTER 1 SOUNDSCAPE, CULTURAL MEMORY, INTERACTIVITY	16
1.1 Soundscape	17
1.1.1 Concept and Elements	18
1.1.2 Sound Symbols	19
1.1.3 The Voice	22
1.1.4 The Acoustic Community and the Soundscape in London	24
1.1.5 Listening and Soundmaking	26
1.1.5.1 Listening Modes	26
1.1.5.2 Public and Private Listening	29
1.1.5.3 Soundmaking	30
1.1.5.4 Noise and the City	31
1.1.6 Musical Approaches to the Soundscape	33
1.1.6.1 Soundscape and Real World Compositions – railway station; underpass	34
1.1.6.2 Narratives – Musical Discourse	35
1.2 Cultural Memory	37
1.2.1 Concept and Narratives	38
1.2.1.1 Text, Voice and Remembering	41

1.2.1.2	Textual and Acoustic Community	43
1.2.2	The Underground as Symbol	45
1.2.3	The London Underground Transport System as Symbol	47
1.3	Where Soundscape and Cultural Memory’s Concepts and Practices Intersect	50
1.4	Interactivity	52
1.4.1	Interactivity in Electronic Arts and in Music	52
1.4.2	Communities – Internet	54
1.4.3	Interface and Interactivity in this project	57
CHAPTER 2	THE MODEL: FIELDWORK AND ARTWORK	59
2.1	Fieldwork	59
2.1.1	Call for Volunteers - Journal	60
2.1.2	Interviewing	62
2.1.2.1	General memories	66
2.1.2.2	Sonic memories	68
2.1.2.2.1	Type of sounds	71
2.1.2.2.1.1	Natural sounds	71
2.1.2.2.1.2	People’s sounds	72
2.1.2.2.1.2.1	Crowd	72
2.1.2.2.1.2.2	Single voices	74
2.1.2.2.1.2.3	Announcements	78
2.1.2.2.1.3	Sounds of Machinery	83
2.1.2.2.1.3.1	Rhythm	84
2.1.2.2.1.3.2	Between noise and music	85
2.1.2.2.1.3.3	Ticket machinery	90
2.1.2.2.1.4	Comparisons	91
2.1.2.2.1.5	Silence	92
2.1.2.2.2	Perception of time	93
2.1.2.2.3	Perception of space	95
2.1.2.2.3.1	Surroundings	95
2.1.2.2.3.2	Body	96
2.1.2.2.3.3	Lines and stations	98
2.1.2.2.3.4	Home	99
2.1.2.2.3.5	Media	100

2.1.2.2.3.6 Orientation	100
2.1.3 Travelling - recording	103
2.1.3.1 Listening	106
2.2 Artistic Work	111
2.2.1 Interface	113
2.2.1.1 Space	113
2.2.1.2 Image	115
2.2.1.3 Sounds	133
2.2.2 Interactivity	134
2.2.3 Technology	136
CHAPTER 3 PILOT, ANALYSIS, CONCLUSIONS	140
3.1 Pilot project	140
3.1.1 Listening and Remembering	141
3.1.2 Navigation	145
3.1.2.1 Path	145
3.1.2.2 A playful experience	146
3.1.3 Perception of time and space (Repetition-layering)	149
3.1.4 The Internet	153
3.1.5 Creation of narratives	155
3.1.5.1 Musicality	155
3.1.5.2 Textual narrative	157
3.2 Analysis	162
3.2.1 Interactive Sonic Environment	162
3.2.2 Creative process: progression of processes of listening and remembering	164
3.2.3 The Voice	170
3.3 Evaluation	170
3.4 Relevance	172
3.5 Applicability	173
3.6 Future opportunities	174
3.7 Conclusions	175

BIBLIOGRAPHY	188
PRIMARY SOURCES	192

LIST OF TABLES

TABLE 1. Spaces, Categories and Sub-spaces	114
TABLE 2. Contribution from Fieldwork to Artwork	165
TABLE 3. Main results Pilot	168

LIST OF FIGURES

FIGURE 1. Navigation menu application	116
FIGURE 2. Entrance	118
FIGURE 3. Ticket Area	119
FIGURE 4. Corridors – Escalators	120
FIGURE 5a. Platform going down	121
FIGURE 5b. Platform going up	122
FIGURE 6. Carriage	123
FIGURE 7. Sub-space Doors	124
FIGURE 8. Sub-space Speakers	125
FIGURE 9. Sub-space Steps	126
FIGURE 10. Sub-space Trains	127
FIGURE 11. Main Menu Web Site	128
FIGURE 12. This Project	129
FIGURE 13. Listening and Remembering	130
FIGURE 14. Keyword – writing	131
FIGURE 15. Start Journey	132

LIST OF APPENDICES

APPENDIX 1. Advertisement in weblog calling volunteers	177
APPENDIX 2. Commuter's biographies	178
APPENDIX 3. Questionnaire Phase 1	181
APPENDIX 4. List of Recordings	182
APPENDIX 5. Questionnaire Phase 3	183
APPENDIX 6. Sample of sounds' selected names	184
APPENDIX 7. Narratives result of personal journal	185
APPENDIX 8. Narratives with voices from the interviews	185
APPENDIX 9. Third phase of the fieldwork	185
APPENDIX 10. Audio commuters interacting	186
APPENDIX 11. Questionnaire Pilot Project	187

ACKNOWLEDGEMENTS

Personal

In the development of this study I would like to thank especially the Ordoñez Muñoz family, Claudia Ferreira Da Silva and Richard Chipping for their exceptional support, courage, shelter, and trust in my personal qualities in undertaking this work. Also, for their wonderful help with the logistics of the fieldwork (by offering space for me to undertake the pilot project and interviews) and for always welcoming me on my (innumerable) visits to London.

To Adriana Alarcón, Claudia Alarcón, my father Israel, Israel H Alarcón and Gloria Tellez, for helpful financial support, without which it would not have been possible to start this study and a life in England.

To Maria Gabriela Alarcón, César Alarcón, Olga Lucía Díaz and all members of my family who - close to or far from an understanding of this study - offered their unconditional support, always believing in all of my decisions regarding explorations towards further progress.

Tireless day-by-day support, encouragement and professional critical evaluation were given by my partner Ron Herrema. He constantly convinced me of the importance of resting and the enjoyment of life: to clarify my ideas, thus to renew my spirit and consequently my creative process.

Encouragement, technical assistance for, and peer curiosity into my work were offered continuously by Mónica Acosta, Sofía Buchuck, Mónica Rubio, Maverick Litchfield-Kelly, Gobira, Michael Chant, Mariana Hornedo, Carlos Mauricio Nupia, Juan Carlos Quintero, Juan Pablo Calixto, Oscar Ortiz, Angelina Hall, Alex Fowler, Ester Fowler and Paola Neglia. This support was offered by colleagues at De Montfort University Rob Weale, Rick Nance, Robert McGinley, Serena Alexander, Ana Maria Alarcón, Charlotte Jones, Diana Utter and Paola Merli.

To the Commuters

For sharing their (deep) feelings, spontaneity, curiosity, interest, and passion; for their commitment and help during the extensive research process - almost one year working with them...; for demonstrating an interest in sound and how this is an important part of their life.

Academic Support

To my supervisors Leigh Landy and Brian Brown for their patience, trust, encouragement, expertise and interdisciplinary perspective to guide this work: this support helped me to find my path.

To Barry Truax, external assessor, and Bret Battey, internal assessor; all members of the Music, Technology and Innovation Research Centre, for being open to and supportive of my ideas, even where these were slightly outside their field; Sue Thomas for her kind advice and expertise; John Drever and Peter Cusack for sharing their expertise with soundscape.

Language Support

I want to thank Katina Glance, who kindly helped me, through the improvement of my English skills, to write the research proposal in 2003.

Special thanks to Paddy Long, who offered her time and professional understanding of (English) language issues to support my written work, to which she brilliantly helped to give a consistent shape in the expression of my ideas during the writing-up process in 2006.

Technical Support

Emily Reynolds, Martin Sheil, and David Houghton.

Institutional Support

De Montfort University for awarding me with the Student International Fund 2006.

Ida Pu from Goldsmiths College for her interest and support.

London Transport Museum – (Oliver Green, Helen Kent, Simon Murphy) for providing a place to conduct interviews, and select the sound material. Also for documentary and historical material about London Underground.

Max Dixon, Policy Adviser for the Greater London Authority’s “Sunder London” strategy for providing documentary material.

The City University of London, through the support of Prof. Simon Emmerson, offering space to conduct the interviews in the first phase of the fieldwork.

London Underground – Platform for Art – Liz O’Sullivan, who gave permission for me to record sound and take still photographs in the LU.

Interactive Group, Queen Mary University of London, for their technical advice and inter-disciplinary interest in the project.

Digital Music Network, at the July 2005 conference in the University of Glasgow, Scotland.

Sound Practice 2006, conference in February at Goldsmiths College, London.

INTRODUCTION

1. Interest

Constantly delighted by the energy and variety of her home city, Bogotá, Colombia, yet suffering from its chaotic transport, the researcher has been captivated by the history of the ideal urban public transport models¹ and how they are representative of particular cultures within any urban society. She has also been interested in visualising transport routines then in rendering them visible to others; and in hearing the mixture of sounds and rhythms created by the machinery of the different transport systems, with the spontaneous reactions of residents and other users.

Kevin Lynch's inspiring remark that "the spatial setting does not merely set limits; it is the source of satisfactions" is an invitation to think of better places to live (cities, or in his utopia, regions) and of their conditions of mobility; particularly to think of elements of which those satisfactions are composed. Lynch's utopian features of a place "might be generated from thinking about how people relate to their surroundings...values spring from our relations to people-in-place" (Lynch, 1998:293).

As a foreigner, the researcher has sensed the need to refer to her own city, through the making somehow "familiar" of associations with places, people, images, and sounds. She explored the underground transport system in general in a previous multimedia artwork (Alarcón, 1998), showing it as a symbolic urban structure linking perceptions of the city. This preliminary art project indicated that the experience of commuting could be a rich source of urban communication and artistic expression that - due to the dynamics, complexity and diversity of urban life - could be captured by new interactive media technologies more efficiently and creatively than other, non-interactive, media.

¹ An example of utopia transport is the one imagined by Kevin Lynch: "a variety of transport modes...noise and pollution have been bred out of them, or if not, their use is strictly confined. There are trains, moving walks and seats, escalators, buses, minibuses, pneumatic tunnels, trucks, group taxis, boats, horses, low-powered carts and wheelchairs, dirigibles, gliders and light aircraft. More often than not, people walk, cycle, skate, or ski, using their own energy to get about. As we scan this list, we are dismayed to learn that this sluggish utopia has failed to invent any new modes of transport, except for fun. It has improved the old modes, makes better use of them, and is dependent on no single one". (Lynch, 1998:304)

When living in London, what caught her attention was that one of the Londoners' complaints about the Tube was that it was a "third world" underground in a "first world" city. Understanding this comment as a comparison between a pre-modern late industrialised world, on the one hand, and the modern world, on the other, the researcher saw the first electric underground built in the world - one which she already had found fascinating and extremely familiar - as an opportunity to link perceptions of commuting. Familiarity with the space lies initially not in comparisons with a particular underground, since in her home city there is no such transport system. However, her commuting experience through a variety of transport systems and her other urban experiences have involved subtle elements that seemed to be emphasized by the London Underground, either through diverse styles of architecture, the variety of people who commute daily, and/or its evocative sounds. These elements led the researcher to perceive the beauty and the violence of the urban space within a single routine, touching profound feelings and memories.

Writers, artists and musicians have widely expressed their memories of this evocative place and of life in the city.² What remnants, though, have been left behind of the daily aural experience? Do they remain in the feelings and memories of the commuters? This time, the researcher wanted - rather than from personal reflection - to approach the space from multiple perspectives, focusing on sound as it is one of the outstanding evocative characteristics of the Tube.

This study attempts to recreate an urban symbol, the London Underground (LU), as heard by daily travellers. It has sought a way of creating a sensitive and meaningful virtual interactive space, which could permeate the most intimate feelings of the citizens during their routine journey through sound. It has focused on the investigation of individual experiences of travelling in the underground in order to discover the common

² Interesting examples in art, sound art and film making from the Underground experience are: *Subway Special a Democratic Platform*, Aldwych tube station, London, November 2000 Frank Brown/Stephanie James; <http://www.kunstradio.at/RADIOTOPIA/contdetail.php?nav=6%7C1&peid=9> Accessed 25 May 2006 Radiophonic Art from Mexico, radio education, Mario Mota, an archaeology of the soundscape of the city of Mexico. Metro Indios Verdes; Moebius Film, Argentina 1996, director Gustavo Mosquera <http://www.ram.org/ramblings/movies/moebius.html> Accessed 28 March 2003 <http://www.fdk-berlin.de/forumarchiv/forum97/f056e.html> Accessed 28 March 2003

and divergent listening perspectives; these can then function as location points in experiencing the aural and visual textures of this sub-urban space. The investigative path deemed by the researcher important to pursue was that of people's aural memories.

2. The Question

The research started with a question that could synthesise the sonic and travelling experience in the underground:

How do individual experiences of listening to the soundscape during the commuting daily routine in the London Underground (LU) form an aural cultural memory for the inhabitants of London?

In other words, how can these individual experiences of listening give us elements of the soundscape that represent the real experience of the journey and, secondly, *how can I create a virtual space allowing these aural memories to be shared, faced and transformed?*

This interdisciplinary study was based on Acoustic Communication concepts and contemporary studies of collective memory. To develop the scholarly and creative work it was necessary to understand the relationships between people and their acoustic environment, and also to understand the processes involved in the expression and sharing of individual memories of the space. The creative work is situated in electroacoustic music studies involving soundscape compositions and other narratives with real-world sounds, interactivity and multimedia.

3. Soundscape and Memory

The theory developed by the scholars R. Murray Schafer and Barry Truax has provided a framework within which to study the concept of soundscape: first, as a social, political and cultural sonic environment analysed from the perspective of listening in rural and urban contexts during different historical periods and, secondly, as a system of organised acoustic communication that emphasises "the way in which the sonic

environment is understood”. (Truax 2001:50) The experience gained by the World Soundscape Project³ through their collection of the soundscape of five European villages in 1975 led to the belief that recurrent listening to the sounds of a particular context creates patterns of communication involving informative and symbolic sounds taken from our shared environment.

Meanwhile, Emily Thompson, in a recent historical study of the American soundscape between 1900 and 1933, has shown how our listening habits have been strongly influenced by concepts derived from views of modernity, in particular its technological and architectural developments. Thompson states that audiences developed the “listening habit” of consuming “new electroacoustic products” of the modern soundscape, diffused through “microphones, loudspeakers, radios, public address systems and sound motion pictures” (Thompson, 2002:7); to distinguish noise from signal became an important “new element of their ‘modern life’”. (Thompson, 2002:247)

Regarding other historical soundscape studies such as Bruce Smith’s *Acoustic World of Early Modern England*, R. Murray Schafer’s *Tuning of the World*, and Alain Corbin’s history of bells in nineteenth century rural France, the historian David Garrioch suggests that during the seventeenth, eighteenth and nineteenth centuries the soundscape in European towns constituted a “semiotic system, conveying news, helping people to locate themselves in time and in space, and making them part of an ‘auditory community’”. (Garrioch, 2003:5) The sound established temporal markers which “shaped individual and collective identities and reinforced patterns of authority”. (Garrioch, 2003:6) In the late nineteenth century this soundscape gradually disappeared, and new sounds such as steam engines and factory bells and horns transformed the sound signals system. Measures of noise abatement⁴ accompanied these changes, controlling the soundscape and also influencing what was culturally acceptable in terms of soundmaking.

³ Barry Truax describes the origin of the World Soundscape Project as “an educational and research group established by R. Murray Schafer at Simon Fraser University during the late 1960s and early 1970s. It grew out of Schafer’s initial attempt to draw attention to the sonic environment through a course in noise pollution, as well as from his personal distaste for the more raucous aspects of Vancouver’s rapidly changing soundscape”. <http://www.sfu.ca/~truax/wsp.html> Accessed 4 November 2005

⁴ David Garrioch states how people’s tolerance of external noise progressively declines; he adds that by the late nineteenth century noise abatement societies were founded. (Garrioch, 2003:24)

The urban soundscape carries a history of relationships between sounds made by humans and sounds made by machinery. Before the Industrial Revolution, “rhythms of labor synchronized with the human breath cycle” (Schafer, 1994:63): voices, hands and feet accompanied work. The introduction of machinery meant that “the rhythms of men and machines got out of sync” (Schafer, 1994:63); through legislation, the voices of street criers started to disappear from the soundscape. The Industrial Revolution and its machinery transformed the infrastructure of cities in order to make them productive and functional for social and economic purposes. A new dynamic of work, with louder machinery and consequently fewer audible voices and other human sounds, became the dominant feature of the new urban soundscape of Europe at the beginning of the twentieth century. Here we have the context that frames the beginning of the history of the London Underground, firstly with its introduction of steam locomotives⁵ in 1863, and later, in 1890, with the new technologies of tube tunnelling and electric traction⁶.

Given these historical elements, it is likely that there exists today a memory of sounds and feelings that influences the way in which people feel and think routinely about the city. The London Underground is a highly important feature of the aural urban memory because it combines within a daily routine the delight - or the despair - elicited by train journeys, a rich acoustic space, and the symbolic experience of travelling underground.

Contemporary studies in collective memory have focused on: the making of memory and its permanent transformation; a memory immersed in daily life and which retains elements regarding past experiences; a memory that could be encountered and transformed by individuals for the development of their own cultural perceptions.

Bal, Crewe and Spitzer (1999) state that memory is expressed through “minimal proto-narratives” or pre-narratives, which remain buried in routine; they are imperceptible because they are not events. The authors describe cultural memory as being active, alive

⁵ After many difficulties, the Metropolitan Railway Company opened the first part of the railway system in 1863 between Paddington and Farringdon. (Halliday, 2001)

⁶ In 1890 the first line using the new technologies of tube tunnelling and electric traction was opened from King William Street in the City to Stockwell. http://www.ltmuseum.co.uk/learning/online_resources/ecobus_omnibus/pg/1901.htm Accessed 25 June 2004

in the present, and how its making is linked with construction of identity. (Bal, Crewe *et al.*, 1999) Wertsch's (2002) proposal focuses on the process of collective remembering which he describes as an "active process; inherently social and mediated by textual resources and their affiliated voices; and inherently dynamic". (Wertsch, 2002) Then, it is likely that through the undertaking of a process of remembering we could access features of the aural memory existent in the routine of the commuting activity.

4. London

London has the prestige of being the first city in the world to have an underground public transport system. It was inaugurated as a solution to the overpopulated centre of London and the chaos being experienced by the city in the latter half of the nineteenth century. During that time, London had poverty-stricken areas in the city centre considered dangerous and noisy. Urban plans were focused on housing solutions in the suburbs. The historian Peter Ackroyd states that:

[O]ne of the motives behind the movement towards the suburbs, both in its early and late forms, was to escape the sheer proximity of other people and other voices; the quietness of a modern suburban street may not equal the silence of villa grounds in Roehampton or Richmond, but the principle of exclusion remains the same. (Ackroyd, 2002:729)

At the beginning of the twentieth century, he says, "new forms of mass transportation, such as the deep-level Underground system, had helped to create a new city". (Ackroyd, 2002:732) The LU was very important in the process of "mass dispersal", and the advertising of "Metro-land" emphasised the non-urban aspects of the new housing areas. Halliday relates how Metro-land was "an advertising slogan adopted by the Metropolitan Railway ... designed to encourage travellers ... to spend their leisure hours in the area served by the railway". (Halliday, 2001:102) He follows by saying that the campaign was calculated "to generate railway passenger traffic" since in the city centre, "underground railways faced intense competition" with other railways and omnibuses. (Halliday, 2001:103)

Colloquially known as “the Tube”, this public transport system’s meaning and purpose has changed throughout its existence; becoming part of the air-raid shelter system during World War II and developing alongside the on-going growth of the population of London, this system has become an urban symbol provoking wide-ranging feelings from its passengers. Numerous memories have been evoked as a part of the unforgettable experience of having travelled at least once by London Underground. It seems to be a unique experience for many locals and visitors, who wonder at the variety of people and the intensity of movement within this cosmopolitan city.

The sonic experience in the LU is reinforced by its diverse architecture, the result of a history of design and construction created by different railway companies⁷ and at different periods of time. Its open air and underground spaces with various forms of illumination; its walls, tiles and floors made of a range of materials, both natural and synthetic; the turnstiles, ticket machines, the trains, rails, furniture, loudspeakers, and the travellers’ activity together frame the aural space of the three million passengers who use the London Underground on a daily basis.

For this study, the researcher chose commuters as a representative group of the whole *acoustic community* of the LU. The writer of the thesis considered it important to study the aural memory of the commuting routine because, in this manner, informative and symbolic sounds remaining in commuters’ memories could be identified and understood as constituting part of an aural urban cultural memory. The repetitiveness of the sounds in the daily routine makes the soundscape familiar to them, and the journey can be understood as a daily narrative⁸. This approach was desirable in taking into account the different routes, times and purposes for each journey and determining the variety of responses towards the soundscape.

This research is situated within an exploratory ethnographic framework exploring how this soundscape is perceived by commuters for them to share dynamic representations

⁷ Stephen Halliday relates the story of construction of the different lines of London Underground in the second half of the 19th and during the 20th century. He mentioned companies such as The Great Northern Railway, The Great Western Railway, The Great Central, Electric Traction Company, amongst others.(Halliday, 2001:41-81)

⁸ In this research, “narrative” is defined as the progress of an individual's experience in the LU, where the perceptions of time and space and responses to the sounds stimulate the creation of memories, giving another dimension of meaning to the experience of commuting.

of the soundscape in an interactive artwork of sound-driven narratives⁹ of the commuting experience.

6. Exploring the City - Method

The exercise of exploring the London Underground soundscape can be understood as the spatial practice of experiencing the city. The French Situationists in 1953 used the term *psychogeography*¹⁰ for the first time to describe a practice of exploring cities through the feelings of people towards the space. This practice introduces terms such as *dérive*¹¹ and *détournement*¹². Through *dérive* people can experience different environments through the city. It was defined as:

[T]he 'technique of locomotion without goal', in which 'one or more persons during a certain period drop their usual motives for movement and action, their relations, their work and leisure activities, and let themselves be drawn by the attractions of the terrain and the encounters they find there'. The *dérive* acted as something of a model for the 'playful creation' of all human relationships.¹³

With *détournement*, already formed aesthetical shapes of the city are transformed towards something else.

Sadler (1999) shows how Debord in his work *Mémoires* (1959) compared the map of Paris Metro with the map of the London railway network. Sadler is interested in the representation of movement through the city, which represents “a sum of

⁹ Sound-driven narrative: This term concerns in this research as the progression of the individual interactive multimedia navigation, where the combination of elements (sounds, texts and images), which inform the interactive multimedia design, is present mainly to create the sense of a sound environment that resembles the experience of the original environment from which the sound was taken.

¹⁰ Guy Debord's (1955) definition of psychogeography “could set for itself the study of the precise laws and specific effects of the geographical environment, consciously organized or not, on the emotion and behavior of individuals”. Today in the web is found a generalised definition: “the study of the precise effects of geographical setting, consciously managed or not, acting directly on the mood and behaviour of the individual.” <http://www.monocularartimes.co.uk/city-tours/psychogeography/definitions.shtml> Accessed 20 October 2005

¹¹ A general definition of *dérive*: “An experimental mode of behavior linked to the conditions of urban society: a technique for hastily passing through varied environments. Also used, more particularly, to designate the duration of a prolonged exercise of such an experiment”. *Ibid.*

¹² A general definition of *détournement* is: “Used as an abbreviation for the formula: *détournement* of prefabricated aesthetic elements. The integration of past or present artistic production into a superior environmental construction. In this sense, there cannot be Situationist painting, or music, but a Situationist use of these media. In a more primitive sense, *détournement* from within old cultural spheres is a form of propaganda, which lays witness to the depletion and waning importance of these spheres”. *Ibid.*

¹³ <http://www.geog.leeds.ac.uk/people/a.evans/psychogeog.html> Accessed 1 May 2006 taken from (Plant, 1992:59)

possibilities...their stimulus to the urban imagination.” (Sadler, 1999:87) He states with this example that “the webs traced by both Paris Métro and London railway maps were of course akin to the routes taken by the situationist drift through Paris and London.” (Sadler, 1999:87) These graphical representations of the city offered different “urban navigational” systems, and in the Paris example “operated independently of Paris’s dominant patterns of circulation.” (Sadler, 1999:88)

An example of a psychogeographical experience of London is the film “London” by Patrick Keiller¹⁴. The documentary is narrated from the feelings of *Robinson*, a Londoner who tries to find himself in the city by reflecting his feelings through emotionally raw and critical expeditions to different places in the city. It is analyzed by Steve Pile, who describes how in this case the concept of *détournement* “does not mean there is a destination. Instead, it instigates a search for points of departure”. (Pile, 2002:212) The relevance of this point will become more obvious below.

In contrast to the experiences of Robinson, told through images of London, in this research, *sound* has been selected as a dynamic resource to experience those urban *expeditions*, and to *navigate* through the city. This is in no way to discount the significance of any of the other senses. Sound was chosen as a largely unexplored¹⁵ and a particularly interesting perspective on the whole spatial experience of an underground journey of its passengers.

Soundscapes of the cities have also been captured and experienced by local communities and artists through soundwalks. They are activities to explore places while recording sounds in order to increase individuals' awareness of their environment. As it is defined by Truax:

The essential purpose of the soundwalk is to encourage the participant to listen discriminatively, and moreover, to make critical judgments about the sounds

¹⁴ Keiller, Patrick. (1994) London [Videorecording] / narrated by Paul Scofield. Channel 4, 1997

¹⁵ There are two recordings of the LU made by the World Soundscape Project in 1975: Lancaster Gate Subway Elevator and Subway (Tube) train ride, and sounds collected by people who contribute to the CD “Your Favourite London Sounds” compiled by Peter Cusack in 2001. (World Soundscape Project Tape Library, 1975; Cusack, 2001)

heard and their contribution to the balance or imbalance of the sonic environment. (Truax, 1999b)

Listening to our own sounds, such as voices and steps, is an essential part of the environmental context. In this way we are not merely listeners, but also participants. Participants' interest in following and marking the route of the soundwalk on a map¹⁶ is also mentioned. Its purpose is to:

[G]uide the route and draw attention to features of acoustic interest. The map may also act as a score, directing the performer's listening and soundmaking activities in a way that is not limited to a specific locale. (Truax, 1999b)

In the Underground, the addition of sound signals, voices, machinery and sounds made by people are important aural referents for commuters. As a result of years of travelling through this environment, the experience has created a strong and clear trace of what the urban experience means and feels.

As a re-acknowledgement of a typical urban daily life situation, the methodology has been designed to explore the London Underground soundscape through each individual's experience with sound, in on-going self-reflection taking place in combination with aural memories. It was inspired by previous experiences with alternative urban community media such as television, radio and video¹⁷, where people produce their own programmes addressing local interest issues, experimenting with new aesthetics and formats, with greater freedom (in terms of both aesthetic and content) than do the mass media. Participation has been one of the key aspects in their development. The media have explored ways of incorporating the multiple voices and perspectives of their participants, promoting cultural production.

The research method involves memories of twenty-four commuters in three phases: interviewing, travelling, and listening. First, the researcher asked about commuting

¹⁶ Soundscapes have been represented in virtual maps (CD Audio, CD Rom or Web sites) recreating particular landscapes. Examples of these works are Annea Lockwood's mapping of Danubio River (Lockwood, 2004: 32) and "The Vienna Soundwalk, A soundscape Information system" designed by Hartwig Hotchmar (Hotchmar, 2004:26)

¹⁷ These media have been developed extensively in NYC and Latin American, Asian, African, and some European cities. Experiences as such have been integrated and analysed worldwide by networks such as Videazimut, and AMARC. The researcher has worked in community radio, video and television in Bogotá and the Tolima region in Colombia. See AMARC for definitions of community radio http://wiki.amarc.org/index2.php?topic=What_is_community_radio&lang=EN&style=amarc&site=amarc Accessed 27 April 2006

memories and in particular about the sonic experience. Secondly, the researcher accompanied the commuter on his/her journey in order to record the experience, yet maintaining as far as possible the spontaneity of the daily routine. Third, the commuters listened to the recordings in order to select sounds meaningful to them. During all of the phases, they reflected on their feelings on the experience of commuting. The fieldwork formed the basis for the development of the artwork.

This method can be described as an ethnography focused on soundscape and the relationships that people establish with the London Underground context in a practice of collective memory. Ethnography¹⁸ is a method used by social researchers to understand specific social contexts from the perspective of people who inhabit them. Ethnography provides an important freedom to this project, allowing the collection of any material that can be useful to understand collective and individual memories and how they are expressed regarding daily life soundscape. To understand the commuting experience in the London Underground, the researcher has used participant observation (i.e. the researcher's personal journal), interviews, travelling, recording and listening. This has been a reflexive¹⁹ practice, one in which commuters follow an interactive process of listening and remembering, which has in turn informed the artwork. This method has involved volunteers (commuters) recognising their personal experience and at the same time involved the researcher in her creative process.

The collection of information about feelings towards soundscape in different spaces and phases, made participants active and conscious about their experience regarding issues of memory and sound. Finally the artwork provokes feelings that people can reflect again in the Interactive Sonic Environment, adding more elements to it.

¹⁸ Charlotte Aull Davies in her book *Reflexive Ethnography* gives a broad definition of Ethnography involving not just such a method but a research process: "The term ethnography is used to refer both to a particular form of research and to its eventual written product. I adopt a broad interpretation of ethnography as a research process based on fieldwork using a variety of (mainly qualitative) research techniques but including engagement in the lives of those being studied over an extended period of time." (Davies, 1999:5)

¹⁹ Davies defines reflexivity as "a turning back on oneself, a process of self-reference. In the context of social research, reflexivity at its most immediately obvious level refers to the ways in which the products of research are affected by the personnel and process of doing research" (Davies, 1999:4)

7. Art – Process – Interactivity

The researcher believes that a public interactive piece of sound art²⁰ can transform the perception of the acoustic environment because it allows for the re-creation of the experience first “lived” in the real space and now re-experienced in a new virtual space. In the latter, the personal experience is reflected and mixed with others’ experiences, offering a different perspective on the relationship established between commuters and the soundscape in the real environment.

The researcher has worked with the commuters on emphasising their life experience and their feelings within a process of remembering, re-experiencing and recording, while listening to and selecting meaningful sounds. The relation between the listening process and the process of remembering may be designated the main interactive process; it can help the discovery and creation of, for the participants, their own aural memories as individuals who form part of an acoustic community.

It is considered important in a virtual environment to provide a structure in which the user can experience an underground journey in a new way. In considering how to create this structure three elements of the soundscape were related: time, space, and memory²¹. It appeared that, after researching the memories triggered by the LU soundscape, they could be organised so as to create a symbolic pattern to be followed. However, it soon became clear that any structure created according to, for example, commuters’ feelings would imply a narrow narrative based on the researcher's reading or interpretation of their memories. The feelings and associations are, furthermore, in a state of permanent variation, transformation and flux - although some coincide; it could be possible to create structures, based, for example, on contrasting “pleasant” with “unpleasant” sounds, or on a comparison of commuters’ journeys with archetypes²² of the underground travel experience. However, a design able to contain a greater variation in these elements of time, space, and memory, of this listening experience, taking into

²⁰ This is a sound artwork where the user needs to perform actions through an interface to trigger sounds and images, in any order, to enjoy the artistic experience.

²¹ Andra McCartney has described how these elements have been used by soundscape composers. McCartney, Andra (2002). Circumscribed journeys through soundscape composition. *Organised Sound* 7(1):1-3

²² An archetype is, according to the Shorter Oxford Dictionary (OUP, 2002): “in Jungian psychology, a primordial mental concept inherited by all from the collective unconscious”.

account the diversity among the commuters and also the characteristics of the interactive media, was sought. It was eventually decided to focus on space as the main element in structuring the journey towards its creating the interface. The underground experience was collected from the volunteers according to the movements made by the commuters, within the soundscape, in completing their respective journeys.

In the real space the commuter keeps a record of the personal experience, which varies depending on the rhythm, the shortcuts and all of the unpredictable events that may happen during the underground journey. Their relation with other commuters and with the space enriches the experience and turns it into a sequence reflecting both how the commuter feels and occupies the space, and how s/he reacts to it. The movement of the commuter interplays with the rhythms of the other passengers and the rhythms of machinery; such movement involves a natural fading in and fading out between the different spaces of the LU. Each space determines an activity and has its own narrative.

In the virtual space, however, the LU soundscape was divided into five main spaces necessarily passed through by the commuter, clicking in the different areas on a computer screen to complete his/her journey by appearing to “move” through them: the entrances/exits, ticket areas, corridors and escalators, platforms, and carriages. Each of these spaces is further subdivided into other categories. Together, they complete the experience of movement in the LU. The commuter is able to hear his/her selected sounds, meaningful initially because of the individual experience of the journey; in the structure, though, they can be linked with others’ sounds in a musical discourse²³, to create textures with sounds triggered by chance yet organised in space and between spaces.

Here, interactivity takes place according to the user’s response to listening, and this in turn is a process of remembering: it is the reflection of the commuter on these sounds and on the journey experience. It is the activity of each user in the virtual space that

²³ Musical discourse, in this research, refers to the perception of musicality in the soundscape whilst combining sounds in the multimedia interface. It is different from making music with sounds of the London Underground, in the sense that in the multimedia, the interface maintains the typical sequence of the different routine journeys. The objective of this interface is to explore the commuters’ relationship with the soundscape within a routine journey.

creates the musical discourse: an experience enriched by memory, culture, the specific individual's appropriation of the space, and of the multimedia structure.

8. The Proposal: Internet, Technology, Multimedia

The Internet was selected as an appropriate medium for rendering the interactive process - including of memory - dynamic, “permanent”, public, and creative, allowing the interplay between sounds and the sharing of memories between users through their listening and responding to the soundscape.

The Internet was chosen as the medium through which to support a multimedia interface that would be able to provoke an encounter between commuters and their daily soundscape in a fresh, new manner. The use of technology is vital as a means of registering, experiencing and re-experiencing the soundscape. It makes the retention of the memory of sounds possible, as well as their selection and inclusion in a multimedia structure. The mere experience of listening to the recordings increases the user's attentiveness and helps to reflect each one's relationships with the sounds and the context.

The original real space is abstracted: sitting in front of the computer wearing headphones, the commuter experiences a virtual journey that refers to a familiar daily soundscape. The environment on the screen may at any moment receive contributions, other sound recordings or excerpts that can fit into the structure. This fact promotes permanence, at the same time facilitating the transformation of the experience, keeping individual descriptions of experience in the public domain. Text is an important feature of feedback, and an element that takes advantage of the Internet to express triggered memories.

The sonic environment is perceived as a place where time, space and memory act as a reflection of a collective experience, incorporating intimate feelings in an interactive

artistic process to find one's bearings, to recover one's self in the individuality produced by the intimate space, and to delight in the practice of producing a shared memory.

In the first Chapter the researcher defines the theoretical background, involving soundscape elements and concepts, collective memory concepts and methods, the manner in which both areas of knowledge intersect, and experiences around different concepts of interactivity on the Web. The model, containing fieldwork and artistic work, is described in the second Chapter. Elements of the soundscape are interpreted based on volunteers' accounts and feelings, and form the basis for the development of the Interactive Sonic Environment. Finally, in the third Chapter, the researcher relates the participants' experience with the multimedia interface, analyses the findings, evaluates the work developed, and states its relevance and applicability.

CHAPTER 1 SOUNDSCAPE, CULTURAL MEMORY, INTERACTIVITY

In this dissertation the researcher has chosen the London Underground (the LU or the Tube) as the sound environment in which to study the relationship that humans establish with a given space. This public transport system may be considered representative of the urban culture of the nineteenth and twentieth centuries. Thanks to its architectonic variety, commuters interact²⁴ during their daily routine with diverse acoustic spaces, machinery, and the usual barriers, staircases, seats, etc., products of more than one century of the history of this public transport system.

The activity of commuting, involving repetitive listening to the sounds in the routine journey, and the condition of sharing the same acoustic space at various times and in a variety of situations, gives rise to thoughts of the existence of an *aural urban collective memory*²⁵. For tourists, families or friends paying occasional visits, delivery personnel, and others who might use the Tube infrequently, this memory will probably neither be as highly developed nor share the same characteristics as those of the commuter's experience. Therefore, this research investigates the aural memory that commuters have of this space, and is proposing the development of a virtual space where these memories can be shared and creatively transformed.

First, in this Chapter the elements which compose a soundscape, understood as an acoustic communication system, are described. Linked to the soundscape, the historical background of the urban soundscape, the related modes of listening studied by several scholars, and the way in which composers have dealt with soundscape issues will be presented. Furthermore, the Chapter describes methods and concepts of collective memory, and the way in which narratives can make memory vital and transformative in the present. After this, relations between the two main theoretical subjects, the

²⁴ Here, interaction concerns the process in which commuters exchange information with the sounds and other elements of the underground during their daily routine.

²⁵ The Aural Urban Collective Memory is concerned in this research with the identification and compilation of meaningful sounds and/or testimonies about sounds remembered by individuals who share a common acoustic space. It is also concerned with commuters' feelings as triggered by sounds, and the whole experience of an underground journey. Later, the origin of concepts and methods of collective memory will be described.

soundscape and collective memory, are analysed. At the end of the Chapter it is suggested that *listening* and *remembering* create an interactive process that can transform the relationship between commuters and the environment. Here, the term "interactivity" is used in two ways: the relationship established by each user with the multimedia interface, and the process in which the user is engaged with the sound and can express his/her feelings through the text. In this study the "engagement" through the multimedia interface attempts to unfold through the relationships between users and the soundscape, generated by a process of listening and remembering. This is inferred through, and is based on interactivity concepts and practices developed in the fields of music and sonic art.

Consequently, the use of technology is proposed in two respects: firstly, to enhance the processes of listening to and remembering a real sound environment and, secondly, to create an Internet-based interactive sonic environment, an appropriate space where these memories can be shared and transformed by the Tube's commuters. These factors are brought together in order to promote the creation of sound-driven narratives²⁶ within a musical discourse²⁷ of the commuting experience.

1.1 Soundscape

In this section, the main approaches articulated by scholars concerning soundscapes, particularly the urban soundscape, are described. The researcher places emphasis on sound symbols, focusing on the sounds from transport systems in urban spaces that have become meaningful for the inhabitants of cities over the years. The more specific experience of London's inhabitants with London's sounds is then mentioned. Also highlighted are, on the one hand, the significance of the voice in the soundscape, and,

²⁶ Sound-driven narratives: This term is concerned in this research with the progression of the individual interactive multimedia navigation, where the combination of elements (sounds, texts and images), which inform the interactive multimedia design, is present mainly to create the sense of a sound environment that resembles the experience of the original environment from which the sound was taken.

²⁷ Musical discourse, in this research, refers to the perception of musicality in the soundscape whilst combining sounds in the multimedia interface. This is different from making music with sounds of the London Underground, in the sense that in the multimedia the interface maintains the typical sequence of the different routine journeys. The objective of this interface is to explore the commuters' relationship with the soundscape within a routine journey.

on the other hand, the processes of listening and soundmaking, in which the voice is also involved. Finally, musical approaches to the soundscape are described. These approaches contain elements of time, space and memory of places, and relate directly to the context of the current research.

1.1.1 Concept and Elements

The study of an acoustic environment involves sonic and cultural issues. *Soundscape* is defined as “an environment of sound (or sonic environment) with emphasis on the way it is perceived and understood by the individual, or by a society”. (Truax, 1999b) It implies a bi-directional relationship between people and the sound environment. On the one hand, the environment is permanently "triggering" sounds and, consciously or unconsciously, we respond to these with our voices and other sounds. In this sense, we are, in sonic terms, permanently integrating ourselves into the environment, doing so with our feelings and attitudes towards the sounds that comprise the soundscape.

To distinguish the sounds within the environment, these have been studied by scholars (Schafer, 1994; Truax, 2001) and classified into elements according to their functionality in the space, namely, *keynote sounds*, *sound signals*, *sound marks*, and *sound symbols*. *Keynote sounds* “are those which are heard by a particular society continuously or frequently enough to form a background against which other sounds are perceived”. (Truax, 1999b) They “are not consciously perceived but they act as conditioning agents in the perception of other sound signals”. (Truax, 1999b) For instance, constant electrical signals coming from electrical household appliances, computers, and air conditioning units could be understood as *keynotes*. A *sound signal*, by contrast, is defined as “any sound or message which is meant to be listened to, measured or stored.” (Truax, 1999b) Sound signals can also be understood as learned sounds that have meaning within our routine, providing information which functions as a warning or as guidance. We can develop our set of sound signals, even with the sounds that are not commonly associated as such with the community in which each individual lives. For example, in our daily routine we establish a familiarity with those devices that give us basic information, such as alarm clocks, mobile telephone ring-

tones, and other sounds in our homes, such as footsteps, the sound of particular doors opening or closing, and so on.

Sometimes sound signals become keynote sounds when, due to repetition, they lose their immediate significance; consequently, we no longer consciously pay attention to them. They may be classified by their meaning, as well as by their acoustic characteristics, and also expressed through “speech sounds, the contexts of interview, story-telling, conversation, recitation, etc.” (Truax, 1999b) If a sound signal is evocative and culturally meaningful for the history of a community, it is named a *sound mark* and defined as one that is “unique, or possesses qualities which make it specially regarded or noticed by the people in that community.” (Truax, 1999b)

Particularly in the urban space, a mixture of machine sounds, voices, footsteps, mechanical games, mobile telephones, speakers, radios, electrical devices, transport systems, and also natural sounds surround us every day, providing acoustic information. Distinguishing between the elements of a soundscape makes our understanding of the whole environment possible, and the history behind them in terms of materials, listening habits, and social structures.

1.1.2 Sound Symbols

When listening repeatedly to sounds during a certain length of time, sound patterns called *sound symbols* are created in our minds. Truax states that:

[O]ver countless repetitions, the images created in people’s minds by such sounds and their contexts build up coherent patterns that may be called *sound symbolisms*. Sound symbols function analogously to Jung’s archetypes (which are strongly visual) in that they are mental and cultural images of great suggestive power. (Truax, 2001:80)

He continues:

[W]hen such symbolisms function for countless people over centuries in many different contexts, the symbol acquires the richness and abstractness of the

archetype²⁸, with its power to find expression in countless specific instances. (Truax, 2001:80)

Each sound becomes associated with an emotion and feeling. In this way fear, nostalgia, happiness, and beliefs associated with the sounds are present in our context and daily routine.

Schafer says about sound symbols that:

[T]hese are inherited, primordial patterns of experience, reaching back to the beginning of time. They have no sensible extensions themselves, but may be given expression in dreams, works of art and fantasy. (Schafer, 1994:178)

When referring to the relation of the archetype with the acoustic symbol, he says that “all acoustic symbolism, even that associated with archetypes, is slowly but steadily undergoing modification.” (Schafer, 1994:178) For instance, natural sounds such as water, wind, and sounds related to any movements of the earth (such as earthquakes) have a strong symbolism and might be associated with archetypes. It may be suggested that each is a sound that shares the same or similar meanings over cultures and generations. These sounds have been found fascinating and mysterious by human beings because they also take us back to our primordial soundscape. (Schafer, 1994) For instance, Schafer claims about water that “it is the fundamental of the original soundscape and the sound which above all others gives us the most delight in its myriad transformations.” (Schafer, 1994:16) The wind, which also “possesses an infinite number of vocal variations”, he said, “is an element that grasps the ears forcefully. The sensation is tactile as well as aural.” (Schafer, 1994:20)

Furthermore, sounds associated with transportation systems have also carried a strong import throughout the history of the urban soundscape in European cities. Between the sixteenth and nineteenth centuries, the sound produced by horses’ hooves and cart wheels was a recognisable keynote informing the traveller that s/he was passing through

²⁸ Archetype is defined by C.G. Jung as “certain types of symbols, which can arise autochthonously in every corner of the earth and are none the less identical, just because they are fashioned out of the same world-wide human unconscious, whose contents are infinitely less variable than are races or individuals” (in Schafer, 1994:178).

a city. (Schafer, 1994) The wheels in particular produced an unpleasant feeling for some city dwellers:

The creaking of wheels is indescribable. It is like no sound ever heard in all your life and makes your blood run cold. To hear a thousand of these wheels all groaning and creaking at one time is a sound never to be forgotten – it is simply hellish. (in Schafer, 1994:62)

Secondly, Schafer shows how the sounds produced by a train triggered sentimental associations. These were also expressed by painters of that time.²⁹ They were sounds with deep mysteries because of their changing character and because of the differences in pitch and gesture, depending on the city in which they were experienced. He describes the train's memorable sounds:

By comparison with the sounds of modern transportation, those of the trains were rich and characteristic: the whistle, the bell, the slow chuffing of the engine at the start, accelerating suddenly as the wheels slipped, then slowing again, the sudden explosions of escaping steam, the squeaking of the wheels, the rattling of the coaches, the clatter of the tracks. The thwack against the window as another train passed in the opposite direction – these were all memorable noises. (Schafer, 1994:81)

The urban soundscape of the twentieth century has been modified more quickly than in the preceding centuries due to technological advances, the transformation of techniques of transport systems and the changing architectural spaces made with new materials. Emily Thompson relates how between 1930 and 1933 in America:

The sounds themselves were increasingly the result of technological mediation. Scientists and engineers discovered ways to manipulate traditional materials of architectural construction in order to control the behavior of sound in space. New kinds of materials specifically designed to control sound were developed, and were soon followed by new electroacoustic devices that effected even greater results by converting sounds into electrical signals. (Thompson, 2002:2)

²⁹ Schafer mentions the painting *Rain, Steam and Speed: The Great Western Railway* by J.M. William Turner (1844). (Schafer, 1994:81)

Whereas transport systems in the nineteenth century changed from steam to electric trains, the twentieth century has seen the power transferred “to the individual” through use of the automobile, motorcycle, and other machines that use the internal combustion engine. (Schafer, 1994:82) Schafer draws inferences about the influence on the minds of travellers of the rhythms of different transport systems as these are shown in poetry and music, such as the influence of “the railroad on jazz and the automobile on contemporary music.” (Schafer, 1994:63) This suggests that the characteristic repetition of the sounds generated by transport systems influences people’s memory and narratives.

1.1.3 The Voice

Within the soundscape the voice is the primary resource most humans possess and with which we can express ourselves in the environment. It reflects moods, fears, feelings, and even the illnesses that a person may have. Truax says that while the voice reflects “the whole person”, (Truax, 2001:34) it also represents the concept of “self and relationships with others” (Truax, 2001:35) and with the environment. According to the architectonic or natural spaces, each voice will sound different because the environment influences the way in which the voice is perceived. “Each space absorbs frequencies, reflects, adds reverberation or echo and thereby changes the timbre and envelopes of the voice.” (Truax, 2001:38) The voice also reflects paralinguistic content. (Truax, 2001:34,38-39) This refers to the features of each language, such as the accents, intonation patterns, stress patterns, timbre, and pauses in an individual's utterances that give us information about the origin, mood, and current attitude of the person.

The Industrial Revolution and the discovery of electricity introduced new and powerful sounds that by their very loudness covered the human voice. Schaefer mentioned, in increasing order of decibels, some of the machines that produce these sounds: the steam engine, a printing works, a diesel-electric generator house, a metal saw, and a rocket launch, which topped the list with 160 dBA.³⁰ (Schafer, 1994:76-77) Furthermore, there

³⁰ The “A” scale is a specific “weighted” version of the dB scale. “Using it the sound meter level is less sensitive to very high and very low frequencies.” (Decibel, Wikipedia, last modified 08 November 2006)

are testimonies about the “rule of silence” existent in mills (interviews from Sadler’s Factory Investigating Committee in 1832, in England): “Is one part of the discipline of these mills profound silence? – Yes, they will not allow them to speak; if they chance to see two speaking, they are beaten with the strap.” (Schafer, 1994:75) Also, Schafer mentioned the suppression of street criers, which is attributed to the invention of the automobile “which muffled the voices of the street criers” (Schafer, 1994:67) rather than to legislation in European, American, and Canadian cities.

On the other hand, amplification systems such as loudspeakers have given power to the voice. An important phenomenon to mention here is the concept of “schizophonia”, coined also by Schafer. It “refers to the split between an original sound and its electroacoustic reproduction”. (Truax, 1999b in EARS, 2004) The voice is detached from its original source through the loudspeaker and becomes an instrument of power. Schafer states:

The loudspeaker was also invented by an imperialist, for it responded to the desire to dominate others with one’s own sound. As the cry broadcasts distress, the loudspeaker communicates anxiety. “We should not have conquered Germany without ... the loudspeaker” wrote Hitler in 1938. (Schafer, 1994:91)

Referring further to precedents of the loudspeaker, he writes:

The telephone had already been dreamed of when Moses and Zoroaster conversed with God, and the radio as an instrument for the transmission of divine messages was well imagined before that. (Schafer, 1994:89)

Voice within the process of communication is an element of “speech”. Truax considers that speech is part of the “continuum speech-music-soundscape” of acoustic communication systems. He explains how these elements are interrelated: from left to right the continuum moves, “increasing sound repertoire, decreasing tightness of syntactic structure, and density of information”, (Truax, 2001:52) influencing its meaning. The soundscape is relatively abstract; the meaning of its sounds is strongly

related to the context whereas in speech, meaning and therefore understanding are still possible even if the speech is removed from its original context.

In this research the relation between speech and soundscape is vital because the voice is important as a form of feedback regarding the soundscape, in which is possible to perceive existent feelings towards the environment. Furthermore, the location of music, as an acoustic system, in the middle of the continuum “speech-music-soundscape” suggests that a musical discourse can be created by the bilateral and continuous interrelation between soundscape and speech, during the processes of listening and recalling, respectively - processes that will be explained later in this Chapter.

1.1.4 The Acoustic Community and the Soundscape in London

When a group of people share and identify a soundscape as part of their life, they comprise what Truax has called an “acoustic community”. This is defined as “any soundscape in which acoustic information plays a pervasive role in the lives of the inhabitants (no matter how the commonality of such people is understood)” and as “any system of electroacoustic communication where acoustic information is exchanged.” (Truax, 2001:66) Garrioch relates how from the sixteenth to the nineteenth centuries the sound was “part of the people’s way of navigating in time, space and in the social world in the city.” (Garrioch, 2003:6) In cities, sound has been an important element to show the structure of power. Garrioch shows how fireworks, drums, and bells established temporal markers and signals of respect in the eighteenth century, giving the privilege to the authorities of the responsibility for creating sound or silence. The identity that people established with the space was influenced by the sound environment,

The familiar soundscape helped to create a sense of belonging: it was part of the ‘feel’ of a particular city, town or neighbourhood, a key component for people’s sense of place. (Garrioch, 2003:14)

Taking into account historical studies (Ackroyd, 2002; Garrioch, 2003), it seems that in London, the community has lost some awareness of the soundscape, which was rich in meaning and used by people to orient themselves in the space. There exist accounts about London’s memorable sounds, which gave the city its aural identity. Peter

Ackroyd relates how in the sixteen-century London “was crossed by streams and rivers”. This continuous sound is described as creating an intimate space for inhabitants: “That perpetual sound was variously compared to Niagara, in its persistence and remorselessness, and to the beating of a human heart. It is intimate and yet impersonal, like the noise of life itself” (Ackroyd, 2002:76). The urban hum has been described as inspiring of personal reflection. “The ‘roar’ here suggests the presence of some great beast, but more significant is the sense of a continuous, distant sound as if it were a form of meditation or self-communing” (Ackroyd, 2002:75). Ackroyd also relates how “one of the characteristics of the sixteenth-century city would be a continual babble of voices making up one single and insistent conversation; it might be termed the conversation of the city with itself.”(Ackroyd, 2002:73)

In the following centuries London was characterized as a noisy city. Ackroyd mentions how “‘To the stranger’s ear,’ a journalist wrote in 1837, ‘the loud and everlasting rattle of the countless vehicles which ply the streets of London is an intolerable annoyance. Conversation with a friend whom one chances to meet in midday is out of the question ... one cannot hear a word the other says’”. The London Soundscape was recalled by people who visit the city at that time:

Is it not strange that I should have an everlasting sound in my ears, of men, women, children, omnibuses, carriages, glass coaches, street coaches, wagons, carts, dog-carts, steeple bells, door-bells, gentlemen-raps, twopenny post-raps, footmen-showers-of-raps, of the whole devil to pay? (Ackroyd, 2002:76)

In this context, the London Underground carries an important memory of noise for its passengers. Different historical anecdotes of journeys in The Tube tell us of symbolic references expressing the dislike and fear of travelling underground. In 1879, a Londoner dentist compares “the noise of the train with the shrieking of 10000 demons above the thunder of the wheels. The sensation was altogether like the inhalation of gas preparatory to having a tooth drawn.” (Halliday, 2001:22) Other citizen in 1887 mentioned: “I had my first experience of Hades today ... I should think these Underground railways must soon be discontinued...”. (Halliday, 2001:23) David Bennett in his book “Metro, the story of the Underground Railway” relates how the first

journey was “noisy and claustrophobic and earned the trains the nickname of ‘padded cells’. A gateman rode on the metal footplates at the end of the carriage and would call out the station names on arrival.” (Bennett, 2004:23)

Bennett mentions how in the underground systems “the bodywork and construction of the cars has echoed the development of materials through the industrial age: first wood then cast iron, steel, stainless steel, and finally lightweight aluminum.” (Bennett, 2004:31)

Today, sonically, the London Underground includes a mixture of materials and spaces with which the passenger interacts daily. The architectonic spaces of the stations built at different times, and the sound diffusion systems, sound signals and the machinery framing the journey of a passenger can echo the history and transformation of the urban soundscape. Therefore, it is likely that while interacting with the soundscape of London Underground today, people can establish links to sounds characteristic of other times, either in London or in other urban societies. Thus, it is possible these links to the past are shared between people from the same acoustic community.

1.1.5 Listening and Soundmaking

In order to understand all of the acoustic information that surrounds us, individuals develop listening habits in order for them to make sense of the space. Listening and soundmaking habits are the product of our experiences and the contexts in which those sounds are being heard. They relate to our relationship with the environment and all of the elements that comprise it: sounds of nature, of machinery, of people, and of the stories linked to them.

1.1.5.1 Listening Modes

There are different listening modes proposed by scholars, of which the concepts interrelate. Pierre Schaeffer defined the *Quatre Écoutes* or four modes of listening,

namely, *ouïr*, *écouter*, *entendre*, and *comprendre*. *Ouïr* is “to perceive by the ear, to be struck by sounds, it is the crudest level, the most elementary of perception; so we 'hear', passively, lots of things which we are not trying to listen to nor understand (Concrete/Subjective).” *Écouter* “is listening to someone, to something; and through the intermediary of sound, aiming to identify the source, the event, the cause, it treats the sound as a sign of this source, this event (Concrete/Objective).” *Entendre* “means showing an intention to listen [*écouter*], choosing from what we hear [*ouïr*] what particularly interests us, thus 'determining' what we hear (Abstract/Subjective).” *Comprendre* “means grasping a meaning, values, by treating the sound like a sign, referring to this meaning as a function of a language, a code (semantic hearing; Abstract/Objective).” (Schaeffer, 1977 in EARS, 2004)

Referring particularly to the listening process in the soundscape, in this research listening can be understood as the process in which attention is paid to the sounds, in order to find acoustic information that could be understood as different, new, and useful. Truax describes listening as “the crucial interface between the individual and the environment.” (Truax, 2001:15) This means that it is the medium through which individuals can perceive the environment and develop attitudes towards it. Truax states that listening is also:

[A] set of sophisticated skills that appear to be deteriorating with the technologized urban environment, both because of noise exposure, which causes hearing loss and physiological stress, and because of the proliferation of low information, highly redundant, and basically uninteresting sounds, which do not encourage sensitive listening. (Truax, 2001:15)

He distinguishes three levels of listening attention, further asserting that listening does not necessarily imply the paying of full attention to the sounds, yet this has been claimed by other authors.³¹ These three levels are “listening in-search”, “listening-in-readiness”, and “background-listening”.

³¹ Truax mentions Wolvin, A.D., & Coakley's C.G. (Eds).(1993) definition of listening which states that “listening always involves a basic process of receiving, attending to, and assigning meaning to messages” (in Truax, 2001:18)

Listening-in-search is the process where particular information or details are consciously found: “the ability to focus on one sound to the exclusion of others”. (Truax, 2001:22) *Listening-in-readiness* refers to the process where we are able to receive “significant information, but where the focus of one’s attention is probably directed elsewhere”, (Truax, 2001:22) even if the sound is unexpected. We pay attention to the whole environment and our awareness is awakened by particular interests, the characteristics of the sounds, associations, and even the discovery of the existence of sounds, which we have not found in other ways. *Background-listening* is called the process when the “sound usually remains in the background of our attention.” (Truax, 2001:24) Truax explains how:

[I]t occurs when we are not listening to a particular sound, and when its occurrence does not have special or immediate significance to us. However, we are still aware of the sound, in the sense that if asked whether we had heard it, we could probably respond affirmatively, as long as the event were not too distant in the past. (Truax, 2001:24)

Usually, there is background listening when there is more or less awareness of keynote sounds. Here it is possible to compare Schaeffer’s *ouïr*, in the sense of a passive attitude to the sounds, with the listening-in-background defined by Truax; *écouter* with Truax’s listening-in-readiness, and *entendre* with Truax’s listening-in-search, implying intention.

Katharine Norman defines listening as “a complex, multi-layered activity of which hearing is but a part. ... References, memories, associations, symbols - all contribute to our understanding of sonic meaning.” (Norman, 1996:2) She describes three different types of listening: *referential listening* in which we connect “sounds to objects, to measurements of time and place, and to learnt ‘symbols’” (Norman, 1996:5); *reflective listening*, which allows us to identify the conceptual meaning of the sounds and their qualities with no “meditation on a sound’s extra-sonic cultural history but a creative, enjoyable appraisal of the sound for its acoustic properties” (Norman, 1996:5); and *contextual listening* which “relates the material to the context of our individual history, and influences both the extent of our imaginative wanderings and the nature of the meanings they provide.” (Norman, 1996:8)

All this suggests that, with respect to the present study, *sensitive listening* as proposed by Truax could contain elements from Schaeffer's *comprendre* and from Norman's *contextual* and *reflective listening*. This *sensitive listening* is a multilayered experience because it involves the memory and associations of an individual, on the one hand, and shared experience, on the other. It is also the most relevant to the project itself: it implies listening to particular sounds that interest us. In this study there is an attempt to be aware of different modes of listening to the soundscape in order to make sense of the meaning of the commuting experience in the LU.

1.1.5.2 Public and Private Listening

The listening process also defines our public and private spaces. On the one hand, Emily Thompson shows how the perception of the space has changed by listening habits derived from ideas of modernity such as efficiency, and the control of humans over the environment. It was reflected in America between 1930 and 1933 with the construction of theatres for musical performances with highly developed techniques to control reverberation. She states how the sound in these spaces was "clear, not reverberant, this modern sound was easy to understand, but it had little to say about the places in which it was produced and consumed." (Thompson, 2002:3)

On the other hand, Schafer says that "sounds not only circulate around the listener, they literally seem to emanate from points in the cranium itself, as if the archetypes of the unconscious were in conversation." (Schafer, 1994:119) In this way, he infers that "headphone listening directs the listener toward a new integrity with himself." (Schafer, 1994:119) Referring to sounds, which are part of our mental world, Truax says that "the way in which sounds are stored in memory, not separately, but in association with their original context, betrays a fundamental aspect of listening process." (Truax, 2001:19)

These facts also established a difference between the acoustic of private spaces, on the one hand, and the street or the noisy public space, on the other. In this manner, the

listening process establishes a relation between a public space and a personal experience belonging to an individual's own mental world of sounds and contextual associations.

1.1.5.3 Soundmaking

Soundmaking is our response to the soundscape (Truax, 2001:33-47); one of our most direct ways of making sound is usually with the voice, yet various sounds can be made with different parts of the body. The voice can be understood as an extension of the (speaking) individual in any space. When a group of people makes sounds, this fact establishes rules about its soundmaking; for instance, it establishes the identity of the leader, the time of making sound and its characteristics. The responses are restricted. Examples of it can be heard, for example, in political, military, religious, and sporting events when the mass responds to the voice or stimulus of one “leader” or team. Silence is also a response; it can be positive or negatively understood. In some cases silence is the choice of a group; in this case, the meaning of the silence is closer to mutuality or commonality. (Truax, 2001:43) In Western society it could be oppressive, understood as a “rejection of the human personality”, (Schafer, 1994:256) while in Eastern cultures it could be almost sacred. (Schafer, 1994:256-259) Silence in the soundscape may be an expression of dissent and also a way of asserting rights. (Garrioch, 2003:20)

Another form of soundmaking is conversation. It reflects the relationships between the participants. This is the kind of soundmaking that could be judged as more democratic because the voice reflects: to make pauses, in order to give the other the chance to speak. Conversation analysis authors believe “that ‘talk’ does things.” (Antaki, 2003) All of the sentences that we exchange in a conversation are derived from the previous sentence and thus explain “social action”. For instance, accounts given in an interview will fail to provide certain elements present in a conversation, such as the relationships established with the other(s), and influenced by the time and the space where the conversation takes place. Truax further describes conversation as creating a counterpoint³² between voices, which “ensure that two or more musical voices go

³² In Electroacoustic Music, “layering” is the term associated with counterpoint: “[A] concept used increasingly in describing electroacoustic work in which ‘layers’ of sound (or sound types) are developed throughout a work, normally at a density whereby the listener can follow each layer. This form of horizontal thinking might be seen to be the equivalent of counterpoint in, for example, Renaissance music.” (EARS, 2004)

together in a balanced manner that allows each to be heard clearly.” (Truax, 2001:42)
When “one voice pauses or holds a tone, the other is free to be active.” (Truax, 2001:42)
If this does not occur, he says, there is “mutual hostility.” (Truax, 1999b)

Therefore, any kind of soundmaking reflects both the relationship between the individual and the environment, and the integration of the individual with the environment, along with the tacit or explicit rules which clarify his/her position in the soundscape.

1.1.5.4 Noise and the City

As a result of our listening habits, we have developed an appreciation of sounds. When sounds are consciously identified as annoying or if they are interrupting our activities, they are called *noise*. Noise is defined by scholars as “unwanted sound”,³³ and this is one of the main characteristics of the urban space.

The sounds of machinery, characteristic of the urban environment, have always been perceived as being more powerful than the sounds made by people. (Schafer, 1994:73 - 79) The repetitiveness of certain sounds and their sonic characteristics allow us to develop certain resistance coping methods to deal with them; we become habituated to sounds that at the beginning were annoying us, even when they contain an amount of decibels higher than the ones we could normally tolerate. (Truax 2001:99) When we are in the environment we can leave these sounds in the background, as keynote sounds, and they take on the function of a “lullaby” in our soundscape. When the environment is full of keynote sounds, it may be difficult to establish differences between the elements of the sonic space, such that our sense of orientation can be lost. The options to interact with the space are minimal, also because we are not able to perceive ourselves as part of the environment³⁴. This is noticeable when we can no longer hear our basic sounds such

³³ Truax claims that noise has been defined as unwanted sound, unmusical sound, any loud sound, and disturbance in any communication. “[T]he most satisfactory definition of noise for general use is still ‘unwanted sound’. This makes noise a subjective term: one person's music may be another's noise. But it also provides the opportunity for a society to come to a general agreement as to which sounds constitute unwanted intrusions.” (Truax, 1999b)

³⁴ Truax describes this situation as being characteristic of “lo-fi” environments - those “[s]ituations where signal detection is difficult or impossible”. (Truax, 2001:23)

as our own footsteps and voice, nor can we hear the voices of others in a conversation. In this situation, one of the parts of the bi-directional relationship mentioned above is taking control over the other, thus creating an unbalanced sonic environment. “The complementary situation”, Truax says, is the “hi-fi” environment, where “all sounds may be heard clearly, with whatever detail and spatial orientation they may have.” (Truax, 2001:23) Therefore, he considers the latter as a “balanced” and “well designed” environment. In terms of this research it is useful to mention Truax's claim that in a hi-fi environment “there is a high degree of information exchange between its elements and the listener is involved in an interactive relationship with the environment.” (Truax, 2001:65)

Historically, noise regulations in cities have been more closely concerned with controlling human rather than machine sounds,³⁵ even if the amount of decibels is more noticeable in machines. Ackroyd described how, in 1929, it was suggested by the British Medical Association that “the ‘city noise’ was ‘a menace to public health’”. He describes how

“[I]nstead of the sound of London being celebrated as a token of life itself, or at least of the energy of the city, it was now being construed as injurious and unwelcome. It had become more uniform and monotonous so that, two years later, a report noted that ‘people are beginning to rebel against this disturbing, wearying factor in their lives.’ It had also become more impersonal and, in response to its dehumanising potential, the measurement of the ‘decibel’ was introduced”. (Ackroyd, 2002:74) p.78

Today, London has a noise strategy that takes into account the measurement of decibels while also promoting the participation of sound artists and the community³⁶ in order to stimulate a different appreciation of the sounds. For instance, taking the subjective

³⁵ Schafer states that “Early noise abatement legislation was selective and qualitative, contrasting with that of the modern era, which has begun to fix quantitative limits in decibels for all sounds. While most of the legislation in the past was directed against the human voice (or rather the rougher voices of lower classes), no piece of European legislation was ever directed against the far larger sound—if objectively measured—of the church bell, nor against the equally loud machine which filled the church’s inner vaults with music, sustaining the institution imperiously as the hub of community life—until its eventual displacement by the industrialized factory.” (Schafer, 1994:67)

³⁶ “The Mayor will encourage arts organisations, sponsors and others to promote creative exploration of city soundscapes, in ways which both enrich personal experience and help create the context for practical improvements.” Policy 97 (GLA, 2004:207)
On the other hand: “The Mayor will expect Transport for London to develop cost-effective plans, as far as Public Private Partnership and reducing constraints allow, to minimise noise and vibration through improvements in the design, operation, monitoring and maintenance of transport infrastructure, while seeking improved London Underground services in pursuit of London’s transport, regeneration and sustainable development needs.” Policy 25 (GLA, 2004:109)

feeling of “noisy city” further, it is worth mentioning here, a compilation of contemporary London’s sounds made by the sound artist Peter Cusack “to discover what Londoners think and feel about their city’s rich and varied soundscape”. (Cusack, 2001) This is an important document of how citizens know, select and enjoy the sounds of the city: they have mentioned as their favourite sounds eleven of the forty associated with the Tube. This demonstrates that the LU’s sounds, like other urban sounds, are appreciated by inhabitants.

The concept of a balanced soundscape is based not just on the power exerted by sounds in terms of decibels, but on the criteria used in deciding what is understood by noise, in which context the noise is produced, and who controls the sound. Our rejection or acceptance of sounds is also related to the memories triggered by these sounds. These criteria depend on the listening habits we have developed since birth. Composers such as Steve Feld (*The Time of Bells*), Hildegard Westerkamp (*A walk through the city*), Claude Schryer (*El medio ambiente acústico de México, Vancouver revisited*), Michael Rösenberg (*La défense.stage urbain, Lisboa, Madrid: a soundscape collective*), Sarah Peebles (*108 – Walking through Tokyo*), amongst others, have expressed through their pieces their appreciation of this contextual sound, which suggests involving the listener through memorable aspects of and feelings towards urban soundscapes.

1.1.6 Musical Approaches to the Soundscape

Soundscape composers have been dealing with “issues of time, memory and place” (McCartney, 2002:1) in the sense that “the soundscape composition deals not only with listeners’ abilities to identify and make sense out of acoustic environments and how they change, but also the patterns and habits of listening and memory.” (Truax, 2002:11) Taking into account these elements composers have developed, "soundscape compositions" and real world music that adopt elements of the acoustic environment. These approaches have also been analysed from their narratives.

1.1.6.1 Soundscape and Real World Compositions – railway station; underpass

Two particular examples are relevant to this research: *Pendledrøm* (1997), a composition by Truax based on a recording made by Experimental Music Forum (SKRAEP) of the railway station in Copenhagen,³⁷ and *People Underground* (1991), a composition made by Norman based on sounds recorded in pedestrian tunnels, which still exist under the Thames. In the first piece, the title of which means "The Commuter's Dream", the sound is "layered in four simultaneous stereo pairs of tracks" (Truax, 1999a:145) and the "cocktail party effect"³⁸ leads the listener to focus on particular sources of interest. The power of the sound is used to symbolize an "imaginary world" or "to create a sense of larger-than-life unreality." (Truax, 1999a:146) As Truax states, "It is hoped that the next day the commuter will hear the musicality of the station's soundscape in a different manner as a result of the dream". (Truax, No date)

Truax's work reflects the expectancy of a commuter on a train platform, and focuses first on the announcements as a repetitive feature while the voices, signals and doors of the train enter the soundscape. When a train arrives at the platform, it involves all the previous sounds in one conglomerate sound that fills the soundscape. Through granulation techniques, this sound acquires timbres that make us perceive a different atmosphere, a journey of the imagination. When that sound fades into the background, the listener can hear that a train is ready to leave. Then, gestures from doors closing and short events such as a girl and a woman talking take the listener to the rail track sound, which movement again involves us in the imaginary journey or "commuter dream". After that, other repetitive gestures of the soundscape, such as that of the train arriving, situate the listener between the recognisable, real sounds and the "dream", both lying within the repetition. Finally, doors and signals are heard again in a sort of common-sounds-of-the-platform section, finishing the piece.

³⁷ The recording was made as an "homage" to the commuters using the central train station in Copenhagen. The artists' group SKRÆP distributed 5000 postcards to the commuters telling them that at that specific time the sound environment was being recorded. Then they could order a CD with music developed by twelve composers from this recording. It was a concept of Jorgen Teller and Per Bul Åcs. The recording was made "during the 2nd January, 1997". (Åcs, Teller, 1997)

³⁸ The cocktail party effect is defined by Barry Truax as "the ability in perception to select one desired sound from a background of ambient noise heard at the same time. For instance, at a party, where many voices are speaking simultaneously, we may 'focus' our ears on one voice and ignore others which are equally strong. Spatial differences in the location of the sources greatly assists this ability". (Truax, 1999b)

Norman's composition explores the underground sound world and the relations between reality and fantasy. She describes it as "an imaginative inner journey" (Norman, 1996:24), which "reminds us of the un-reality available in real life." (Norman, 1996:24) In this work, when people descend in lifts and the metal doors open, the voices of babies, children, adults, and the elderly come together in a series of conversations and people's footsteps. At the end of the piece the conversations are mixed together, condensing the time experience into a "multicoloured" mass of underground reverberant sound. Finally, this dream finishes when people re-emerge above ground and conversation returns to a mundane exchange between people in the street. The work has a "simple 'narrative' - a descent from above ground, a journey underground and re-arrival at the surface - this musical underground journey descends beyond reality, and beyond temporal narrative." (Norman, 1996:24)

Both works take elements from the soundscape in their narrative, presenting the context with no transformations at the beginning or at the end of the piece. While Norman takes voices as a central element, involving them in the reverberant space, Truax emphasises the train's sound, brakes, or tracks, to involve the listener in yet another atmosphere within the sounds. The two composers thus highlight an imaginary world that could be part of the real quotidian life.

These two approaches to the soundscape, one taken from a train station, and an experience of walking through an underpass in London, resemble personal experiences' entering their own inner mind worlds, surpassing the idea of "reality" by representing a real space intrinsically dynamic in time and space, touching memory through evocative real world sounds.

1.1.6.2 Narratives – Musical Discourse

In analysing narrative functions³⁹ and their tendencies in electroacoustic music Simon Waters highlights the use made by composers of documentary or anecdotal material

³⁹ Waters makes a taxonomy of narratives that can be "invoked in the electroacoustic music": Narrative 1 (involving literal, semantically significant text); narrative 2 (programmatic-illustrative); narrative 3 (documentary-anecdotal); narrative 4

where the characteristics of the acoustic events in the environment and context “stand for themselves.” (Waters, 2000) He refers to Luc Ferrari’s “Presque Rien” series of works⁴⁰ as an example of using “this structuring principle”, and also to the soundscape works which have “a hugely varied aesthetic” and are “less interventionist” in the sounds, with tendencies towards “realism” and “naturalism” : concepts that, he says, are permanently changed by context. Moreover, Waters highlights Norman’s article where she situates the role of the composer “as storyteller”, in the wider sense, allowing the composer “to ‘own’ the material, incorporating aspects of the personal which gives the work authority, and which ‘may in turn function to allow the listeners’ ‘creative incorporation of the ... experience as their own’.” (Norman, 1994:107 in Waters, 2000) In this article, Norman mentioned how “the recording plants a ‘new’ memory in our minds” (Norman, 1994:108). “The recording acts as an *aide memoire*, but in fact it may significantly change our memory, particularly on repeated listenings, as we correct or ‘update’ our experience and deepen our listening attention.” (Norman, 1994:108) She states that, when listening to a composition with real-world sounds, as listeners

[W]e accept, and emotionally incorporate, an interpretation of events which we haven’t ourselves experienced and personally remembered, in the same way that the audience incorporates the performance offered by the storyteller. (Norman, 1994:108)

Simon Emmerson has defined two types of musical discourse in electroacoustic music, according to the syntax used in its creation. The works which include “environmental recording minimally edited or altered” (Emmerson, 1986:38) are situated in the *mimetic discourse dominant* using *abstracted syntax*. In this type of discourse the “focussing and framing process using narrative natural sound sources, while respecting the autonomy of the original sounds, may be used therefore not to obscure but to heighten our awareness of the environment.” (Emmerson, 1986:38). In this discourse there are noticeable timbral characteristics in the natural colour of the sound and syntactic relationships between natural events. He argues that this kind of discourse was

(documentation of compositional process); narrative 5 (use of structural or semantic strategies from natural language, or which are more frequently associated with the linguistic realm). (Waters, 2000)

⁴⁰ *Presque Rien no 1, Le lever du jour au bord de la mer; Presque Rien no 2, Ainsi continue la nuit dans ma tête multiple, and Presque rien avec filles.* (Ferrari, 1995)

developed by artists, “as a reaction against the sophistication of tape and hence sound-object, manipulation of the late 1950s and early 1960s.” (Emmerson, 1986:34)

Structuring principles are part of the intent to render the listener part of the soundscape, such as overlapping space and time, with the sound minimally altered. Memory is an important element for the composer and for the listener in order to establish a bridge with the context, creating imagery or memory from the real context, touching issues of identity with the material.

Given this theoretical background the researcher can state that the London Underground’s soundscape involves elements of the urban acoustic environment and the symbolic elements attached to it. These can be perceived as part of commuters’ routine, in which listening habits are involved. The voice is an important element through which to perceive how commuters feel in the soundscape and how they become integrated to that space. Their accounts about the experience in the environment of the Tube can show meanings and feelings that this public space elicits from them, and will also reflect their modes of listening: their passive or active attitudes towards the sounds. On the other hand, recordings from the environment have an intrinsic characteristic of evoking memory. In the listening process, recordings might create a new memory, too, according to individual experiences, feelings, and changing listening modes. Therefore, the London Underground can be seen as an appropriated space in which to develop narratives that situate commuters as “story-tellers” of their daily life experience - rather than their being merely a passive audience, taking into account such elements as time, space, and memory.

1.2 Cultural Memory

Memory is that which, in this research, forms the link in the relationship of the individuals with the soundscape. However, the relationships and associations between individuals make the soundscape culturally meaningful, *collective*, for a determined community. Several authors have studied collective memory and have developed methods and concepts, according to particular case studies. This research takes the term,

“cultural memory” to refer to the aural memory evoked by the soundscape of the London Underground. The research focuses mainly on the process of remembering (Wertsch, 2002) as an active process of creation and sharing experiences about a common space. Here, the primary concepts will be described and will constitute the basis for proposing an ethnographic method linking the process of listening to the soundscape, on the one hand and, on the other, the process of remembering, towards an interactive artistic process.

1.2.1 Concept and Narratives

“Cultural memory” is a name introduced by contemporary scholars (Bal, Crewe et al., 1999) to discuss collective memory. This concept is understood as an individual and social cultural phenomenon of recalling memories that establishes links between experiences lived in the past with new events in the present. The authors describe memory as “active and it is situated in the present” (Bal, Crewe *et al.*, 1999:viii); they show how its making is linked with the construction of identity⁴¹.

The theoretical basis of collective memory lies in studies made by the French sociologist Maurice Halbwachs in 1925 on *Les cadres sociaux de la mémoire* [*The Social Frameworks of Memory*]. (Halbwachs, 1992) These studies stated that individual memory exists if it is socially shared. A shared memory creates what he called “the social frameworks of memory”. “Every collective memory”, he said, “requires the support of a group delimited in space and time.” This is a socially constructed concept because “the framework of collective memory combines and binds our most intimate remembrances to each other”. (Halbwachs 1992:53) It is important for individuals to build these “frameworks” in order to assure and recreate their identity within a specific society.

Studies on collective memory became widespread, particularly after World War II, and the migration of Europeans to other countries in the framework of a socio-politico-

⁴¹ Through a compilation of case studies in collective memory from the Holocaust, French nationalism, Palestinian and Israeli collective memory, and European and American culture, the authors reflect issues of identity.

economic re-organisation of the world. After collective traumatic events or immigration processes, there is a common need felt by individuals to reflect their thoughts on their national identity, and to maintain links with the past. Nowadays, it seems that each new study in collective memory needs to build its own concept, as it appears that no agreement exists between scholars as regards a definition of collective memory and its methods of accessing memories. (Kansteiner, 2002)

Analysing the importance of reformulating the method for collective memory studies, the historian Kansteiner, suggests the opening of a dialogue between memory makers and memory consumers⁴² so as to construct meaning by adopting methods used by communication and cultural studies. This perspective is allied to the composer John Drever's proposal for the inclusion of ethnography into the exploration of soundscape composition by taking into account disciplines "engaged with the making of representation" (Drever, 2002:21) and collaborative work in context, promoting the "interplay, dialogue or communication", to obtain different representations of the soundscape. As a primary reference of a study linking ethnography and soundscape, Drever cites in his article the work of Steven Feld, who studied the relations of Papua New Guinea's population with sounds of nature, identifying similarities of children's and women's songs with bird songs. Feld's intention was to "study ways sound and sounding link environment, language and musical experience and expression". (Feld, 1994)

In England a project linking ethnography and soundscape is "Sounding Dartmoor"⁴³, led by Gregg Wagstaff and Helen Sloan, which investigated people's taste regarding familiar sounds. This experience has included soundwalks, surveys, sound nominations, the production of a CD of evocative sounds and a website.

The methods proposed by contemporary scholars through which to approach collective memory are based on the construction of narratives. Scholars state that "[N]arrative in cultural life" is important as a "privileged form of communication, information and

⁴² Kansteiner suggests how collective memory should be conceptualised as a result of the interaction between three historical factors: intellectual and cultural traditions of narratives that frame representation of the past, memory makers who adopt and manipulate these traditions, and memory consumers who use or transform cultural artefacts according to their own interests. (Kansteiner, 2002)

⁴³The objectives and development of the project are described by John Drever and are available on <http://www.sounding.org.uk/intro.html> Accessed 29/10/06

artistic reflection” (Bal, 1995 in Bal, Crewe *et al.*, 1999); narrative reintegration remains vital “for integration of the traumatizing events of the past” and “[T]he recipients of account perform an act of memory that is potentially healing.” (Bal, Crewe *et al.*, 1999:x) In this sense the recalling or acts of memory: “thus become an exchange between first and second person that sets in motion the emergence of narrative.” (Bal, Crewe *et al.*, 1999:x) The second person is the witness, mediator, “artist or critical reader”.

Scholars also analyse where memories reside and which are the characteristics of those memories. Bal, Crewe and Spitzer (1999) affirm that the activity of memory is related to habits: background memories “are strongly routine based.” (Bal, Crewe *et al.*, 1999:viii) They state that memory is expressed through “minimal protonarratives”, which “remain buried in routine” (Bal, Crewe *et al.*, 1999:viii); they are imperceptible because they are not events. They distinguish between routine or habitual memories, narrative memories, and traumatic recall. The first is “lying dormant and suddenly become narrative memories” (Bal, Crewe *et al.*, 1999:viii); narrative memories are “surrounded by an emotional aura that makes them memorable” (Bal, Crewe *et al.*, 1999:viii): composed of a string of events “memory offers high and low accents, foreground and background, preparatory and climatic events.” (Bal, Crewe *et al.*, 1999:viii) Bessel A. van der Kolk and Onno van der Hart (1995) affirm that traumatic recall “cannot become narratives”. “In narratological terms” the *repression* “interrupts the flow of narratives that shapes memory; *dissociation* splits off material that cannot be reincorporated into the main narrative.” (Bal, Crewe *et al.*, 1999:ix) They say “[W]hat is repressed is pushed downward to the unconscious” (168-69 in Bal, Crewe *et al.*, 1999), which is only accessible through symbolic representations.

Elliot (2005) highlights three “key features of narrative” used in social research: first, “it has a temporal or chronological dimension in that it provides a representation of a series of events or experiences rather than describing a state of affairs”; second, “it communicates the meaning of events or experiences through the use of evaluative statements and through temporal configuration of events”; and finally, “there is an

important social dimension to narrative: narratives are ubiquitous in society and are a popular form of communication”. (Elliot, 2005:15)

This is a study that applies collective memory as a method, including the use of narratives. In this research, “narrative” is defined as the progress of an individual’s experience in the LU, where the perceptions of time and space and responses to the sounds stimulate the creation of memories, giving another dimension of meaning to the experience of commuting. An exploratory ethnographic work forms the starting point from which the researcher investigates how this soundscape is based on the commuters’ daily routine. In the methodology, the researcher emphasises routine and modes of listening (*see* Chapter 1, p.26) within the commuting, and how these modes could vary according to the phase of the fieldwork and the recalling process. Listeners are understood as being memory-makers, thus as being individuals who can share their respective representations or narratives of the soundscape. They can offer a unique contribution towards shaping the meaning of the collective experience through these representations - while still observing and experiencing individuality. To determine the natures of these representations, the current research takes into account past memories and current routine. The researcher will thus compile a range of perspectives on and expressive responses towards the environment.

Assuming the existence of memory in the routine, the method applied in gathering information involves asking individuals about their experiences in a shared space, in order to identify the common elements and represent these in a virtual space where they will be made more explicit, through the different perspectives and expressive responses.

1.2.1.1 Text, Voice and Remembering

Amongst theories and perspectives of collective memory studies this research focuses on that proposed by the Russian scholar, James Wertsch. He has a particular approach, conceptualised in the “process of remembering”, which he defines as:

[A] form of mediated action, which entails the involvement of active agents and cultural tools. It is not something done by an isolated agent, but it is also not something that is somehow carried out solely by a cultural tool. Both must be involved in an irreducible tension. This has several implications perhaps the most important being that because cultural tools reflect particular socio-cultural settings, mediated remembering is also inherently situated in a socio-cultural context. (Wertsch, 2002:13)

For Wertsch to define and characterise his perspective of collective memory in terms of “mediated action”, he draws a distinction between two versions of the collective memory: the strong version, and the distributed version. The strong version of collective memory relates to the existence of a collective consciousness in the “minds of the individuals of a collective.” (Wertsch, 2002:21) In contrast, in the distributed version, “the representation of the past is distributed across members of a group” (Wertsch, 2002:23) by different means; this can be categorised as homogeneous, complementary, or contested distribution. The homogeneous is the “simplest version”, when all the members of a group have more or less the same representation of the past. In the complementary version the members of a collective “remember different things” from “different perspectives”, yet there is a system where the pieces of their stories would match; members of these groups can be interested in interacting with each other to accomplish their stories. Finally, contested distribution establishes a “site of contestation rather than a form of information storage.” The members of a collective do not work together as such: “they exist in a system of opposition and contestation”, also “competition and conflict”. (Wertsch, 2002:24)

Taking into account definitions mentioned above, it is possible to distinguish that in the LU there is a *strong* version and a *distributed* version of collective memory. The Tube map, tickets and other elements important to travel are part of the strong version of collective memory. A distributed version is related to individual experiences of commuting, which elements could be - or not - shared by the rest of the passengers.

As a mediated action, collective remembering involves three basic terms, namely, text, voice, and remembering. The text is referring to the way in which the language of whoever tells a story shapes its content. The voice relates to the intention of the speaker,

and the intention that is behind his/her voice.⁴⁴ The process of remembering is related, as was previously mentioned, to the “textual resources” utilised in talking or writing about the past, to how those texts could show an image of the view of others who have utilised them and, eventually, to the addition of the voice of whoever is recalling. (Wertsch, 2002:17)

Here it is interesting to compare Wertsch’s view of the process with the relation established by Bruce Smith between the activities of voicing, listening, and recalling in the Early Modern England. (Smith, 1999:97) Smith said that the three activities are related to sound. He mentioned that exercises in *Ludus Literarius: Or, The Grammar Schoole* (Brinsley, 1612) advise the teacher to speak carefully: “while teacher is speaking students write and at the same time sound out the phonemes themselves”. (Smith, 1999:119) The act of recalling is related to the voicing and to the writing. The handwriting then, was keeping a memory of those sounds. Also, techniques of remembering used by speakers, musical performers, and writers used to “insinuate the human body” and he infers that “what we need are ways of reading graphemes as indices of somatic experience”. (Smith, 1999:129) Smith affirms that the writing points “toward something that is absent”. Writing is recording memory in the words of what is heard. Later, as if it were a recycling process, writing will become part of the conversation.

1.2.1.2 Textual and Acoustic Community

It is in the process of remembering where the development of narratives can be addressed within what Wertsch has called a “textual community”, a group using a set of cultural tools, language, and objects to produce narratives or “a specific type of community, - namely, one grounded in the use of a shared set of texts.” (Wertsch, 2002:62) This concept of textual community could be linked with Truax’s concept of acoustic community. However, these concepts differ in the sense that Wertsch’s

⁴⁴ Here Wertsch refers to the notions of “voice token”, which produces “a unique utterance or text with all its unrepeatable aspects”, and the “voice type” which is “heard in the word before the author comes upon it”, paraphrasing Bakhtin (1986b, p.122) (Wertsch, 2002:17)

community is created by sharing texts and producing narratives while Truax's community shares the acoustic environment, no matter how "this commonality is understood" (*see above*).

By individuals' using the same narratives and cultural tools a "textual community" can be founded, according to Wertsch. In his theory, the textual community could be *implicit* or *imagined*, depending on the function of the tools in the formation of a collective. He defines an *implicit community* as a "group of individuals who use a common set of cultural tools even though they may be unaware of this fact and may make no effort to create or reproduce their collectivity". (Wertsch, 2002:63)

Cities are places where different implicit communities live, located in streets or buildings, or sharing daily life activities. For the implicit community the cultural tools are used with instrumental purpose, and individuals have little impact in the formation of a community recognised by its members. It may become an imagined community. On the other hand, the *imagined communities* use all the tools available to identify themselves as members of the community. Examples of imagined communities are easy to identify on the Internet, where electronic mail and other web service companies creates the medium, e.g., Yahoo provides the tools to develop its community. The level of appropriation of the cultural tools, for example, within the use of technology, influences the motivation and interaction between its members.

Cities and the Internet have been intentionally mentioned as clear examples of communities described by Wertsch. This approach, thus, takes into account the nature of the Internet as a medium that promotes the creation and development of virtual communities. In these terms the London Underground environment, the case study of this research, might be understood as an acoustic community, which is *implicit*, engaged with its own system of sound signals and, at the same time, as a textual community daily exchanging and creating language based on the commuting experience.⁴⁵ Therefore, it becomes simpler to imagine commuters as a potential virtual community if

⁴⁵ The weblog "going underground" is a good example of a textual community created from the commuting experience in the London Underground. *Going Underground* (journal) <http://london-underground.blogspot.com>. Accessed November 2003; *Going Underground* (net) <http://solo.abac.com/themole>

it is involved in a process of collective remembering. One of the purposes of this research is to identify elements of soundscape, understood as a set of texts, that are shared by LU's acoustic community, and to reflect on the options of how the creation of an interactive sonic environment can elicit the development of sound-driven narratives from the members of this community, particularly commuters.

1.2.2 The Underground as Symbol

It is, with respect to the commuters' feelings and symbolic representations associated with the Tube, considered significant to refer to the symbolic meaning of "going underground". For individuals this experience carries mystery, fear and magic; it is an encounter with darkness, with the unknown, and as such is present in several myths all over the world. Wolkstein and Kramer (1983) explains the meaning of underground myths as follows:

The path of the descent has "impelled" the mystic since the beginning of recorded human experience. In many traditional societies, initiatory tribal rites are often characterized by a symbolic descent into and ascent from the labyrinthian Earth Mother. These rituals give women and men the experience of being reborn on a spiritual plane. According to Mircea Eliade, traditional rituals of the descent tend to follow a universal pattern: (1) separation from the family; (2) regression to a pre-natal state, the cosmic night; (3) death, dismemberment, suffering; (4) rebirth; and (5) killing of another. (Paraphrasing Eliade, 1960:197-200, in Wolkstein and Kramer, 1983: 156)

One of the Sumerian myths makes the exciting connection between sound and the underworld when Inanna, the goddess of the Great Above, decides to visit her elder sister Ereshkigal, goddess of the Great Below. The first thing Inanna does is to "open her ear" to the underworld:

From the Great Above she opened her ear to the Great Below.
From the Great Above the goddess opened her ear to the Great Below.
From the Great Above Inanna opened her ear to the Great Below.

My Lady abandoned heaven and earth to descend to the underworld.
Inanna abandoned heaven and earth to descend to the underworld.
She abandoned her office of holy priestess to descend to the underworld.

The Descent of Inanna – The Huluppu – Tree (Wolkstein and Kramer, 1983)

Although the story does not describe what she could hear, it is noteworthy that Inanna's first action on entering this world is the opening of the "ear interface" as if it were one of the seven gates that, later in the story, she needs to open to gain access to this unknown world. In the Sumerian stories musicality is an important feature and the repetition of the sentences creates a magical sense of travelling to other worlds. In Inanna's myth, the story and the rhythm of the narrative form part of the underground journey.

The experience underground has also been related to a journey to our inner mental world. It is interesting that our first idea of the outside world comes through the sound in the maternal womb:

The first sounds to which the ear is exposed as it develops in the fetus are human sounds, and from that point onward, the voice and human soundmaking are sounds to which we are most sensitive as listeners. (Truax, 2001:33)

Furthermore:

The ocean of our ancestors is reproduced in the watery womb of our mother and is chemically related to it. In the dark liquid of ocean the relentless masses of water pushed past the first sonar ear. As the ear on the foetus turns in its amniotic fluid, it too is tuned to the lap and gurgle of the water. (Schafer, 1994:15)

Later, this environment is culturally and physically transformed, from a liquid environment to air. It is possible that unconsciously we desire to return to it; and maybe

this could explain our fascination with water sounds⁴⁶, voices or habits such as the use of headphones and the consequent isolation of the exterior environment.

In this study, an underground journey could be considered a metaphor for reverting to our experience in the womb. We are outside, above ground, and, thanks to a very complex transport system created in the second half of the nineteenth century we can experience a journey to the interior of the earth. The researcher considers this analogy relevant to reaching a deeper understanding of the commuting experience.

1.2.3 The London Underground Transport System as Symbol

The Underground transport system is itself a sign⁴⁷ left by the nineteenth and twentieth centuries to our contemporary urban culture. In his book, *In the Métro*, the French anthropologist Marc Augé suggests that from the trio “*Métro, boulot, dodo* [subway, job, sleep]”, as symbols of modern alienation, it would be interesting:

[T]o understand how the sense of individual life is born of the global constraints that apply to all social life. Except for a few cultural details and a few technological adjustments, every society has its subway, and imposes on each and every individual itineraries in which the person uniquely experiences how he or she relates to others. (Augé, 2002:69)

Urban sound practices transform our respective private environments, and the way that we relate to others. In the urban environment, a metaphorical returning to the interior can be represented in the underground transport system through our taking a journey. However, this time, it is no longer a private environment; we are sharing the same "bubble" with millions of other, unfamiliar people. A comfortable or an uncomfortable experience, it is a routine performed daily by many commuters all over the world, where individualities and its social boundaries are crossed. Augé has named this

⁴⁶ Schafer states “Of all sounds, water, the original life element, has the most splendid symbolism (...) Rain, a stream, a fountain, a river, a waterfall, the sea, each makes its unique sound but all share a rich symbolism. They speak of cleansing, of purification, of refreshment and renewal.”(Schafer, 1994:170)

⁴⁷ I am referring to sign as one of the four fundamental elements of semiology, a concept elaborated by Roland Barthes in *Elements of Semiology* (1964) where “any system of signs regardless of its substance or limits: images, gestures, melodic sounds, objects, and the compounds of these substances that can be found in rites, protocols or spectacles constitute, if not languages, at least systems of meanings ... It has two aspects: the perceptible or audible or signifier, and the signified, contained in and carried by the first”. (Armand Mattelart, 1998)

experience one of “trivial” collective memory, referring to the experience lived in his exploration through the Paris Metro:

But one must above all admit that every day individuals borrow, so to speak, itineraries they have no choice but to follow, constrained by memories that are born of habit and that sometimes subvert it, brushing by, unaware of, but sometimes having an inkling of, the history of others, taking paths plotted with a collective memory turned trivial, whose efficacy is perceived only occasionally at a distance. (Augé, 2002:25)

The London Underground is a powerful urban symbol - not just for its being the first underground electric system in the world, but because it is one of the main features in the signalling system of the whole city. Its map, designed by Harry Beck in 1933, is one of the most important icons for London and has been exploited by designers and artists. Simon Patterson’s popular print-work “The Great Bear” (1992), for example, places on the map the names of “scientists, saints and philosophers to comedians, explorers and footballers.... [it] subverts the concept of maps and diagrams as authoritative sources, and challenges our assumption that they can be utilised without question by taking this iconic information source and adding his own idiosyncratic data to it.”⁴⁸

Also, the London Underground has been one of the places where Londoners and foreigners keep particular memories and feelings of London due to memorable events in the history of the city between the nineteenth and the twenty-first centuries. Events worth mentioning are the expansion of the city through the idea of Metro-land⁴⁹; the role of the Tube as a shelter for residents during the two World Wars; the fire at Kings Cross/St. Pancras in 1987, and as the target of terrorist attacks in 1973, 1993 and 2005. These symbolic traces have inspired writers and painters who have created works such as the BBC documentary “Metro-Land” (1973) made by the poet Sir John Betjeman⁵⁰, and the series of paintings called “Tube Shelter” (1941) by Henry Moore. His “Tube Shelter Perspective” displayed in the Tate Modern is remembered specially as it “brings back the memories of nights spent sheltering from bombs in the London

⁴⁸ (Wikipedia, 2006) Accessed 29 October 2006.

⁴⁹ Metro-land was “an advertising slogan adopted by the Metropolitan Railway ... designed to encourage travellers ... to spend their leisure hours in the area served by the railway”. (Halliday, 2001:102)

⁵⁰ In “Metro-land” Betjeman created “a series of vignettes of life in the suburbs of Metro-land” with commentary, verses and “interwoven with black and white film shot from a Metropolitan train in 1910” (Wikipedia, 2006) last modified 14 October 2006.

Underground”⁵¹. However, the memory and symbolic experience addressed by this research lie in the commuters’ aural memories as they recall their daily routine.

R. Murray Schafer states that “[t]wo great turning points in human history were the change from nomadic to agrarian life, which occurred between ten and twelve thousand years ago, and the transition from rural to urban life, which has occupied the most recent centuries.” (Schafer, 1994:53) In such terms as regards the experience of commuting, this could be understood as a third turning point, a reverting from the urban to the nomadic style of life. To take this idea further, the commuter could be described as an urban character who develops a particular perception and appropriation of the city in his/her routine. This appropriation is more closely related to the virtual experience when each individual is forming a conception of the space. The commuter’s experience is closer to the nomadic experience because there is no settlement. In order to find one's bearings within the space, s/he establishes possible routes and thus creates a sort of virtual map. Therefore, the sonic perception of space is an accumulation of various experiences, the taking of fragments from different routes.

To summarise: according to Wertsch’s classification of communities “commuters” can be described as an implicit community, one that uses machinery, graphic and sound signals, maps, objects, and spaces as cultural tools in their everyday travelling. They can constitute a textual community, which is compared in this research with the concept of acoustic community. Voicing, writing, listening, and recalling are elements interrelated by this study through an ethnographic method, capturing features of the commuters’ routine experiences. The ethnographic method will include modes of listening and the process of remembering to make the aural cultural memory, produced by the relationship between commuters and the LU’s soundscape, dynamic and reflective. This particular soundscape, the London Underground, carries a symbolic meaning, considered by the researcher to constitute a link that can bring together fragments of memories from individuals who share the commuting experience; this is done in an attempt to create narratives of a shared space.

⁵¹ Comment made by Thomas Ware, Tate member since 1996. In <http://www.tate.org.uk/magazine/issue2/moore.htm> Accessed 29 October 2006

1.3 Where Soundscape and Cultural Memory's Concepts and Practices Intersect

Finding points of convergence between the soundscape and cultural memory is possible when it is assumed that the former, the soundscape, as defined above, implies a relationship with the space based on the exchange of acoustic information between people and the sound signals, keynote sounds, soundmarks, and sound symbols. The latter, cultural memory, implies the relationship and creation of narratives between groups of people who share memories of an experience lived in a common time and space. In that context, it is believed that cultural memory is daily produced by an "acoustic community", in Truax's terms, which can be related to the concept of "textual community", following Wertsch's concept.

Both approaches to the context, acoustic and textual, imply active processes of information exchange involving emotions and feelings. The listening process as suggested by Truax is the "crucial interface" between individual and environment, which determines each individual's perspective while listening or his/her attitude towards the soundscape. The "process of remembering" proposed by Wertsch, refers to a "mediated action, which entails the involvement of active agents and cultural tools" when recalling memories. Therefore, listeners are assumed in this research as the "agents" or in other words "memory makers", and the cultural tools, as the means through which that "crucial interface", or the listening process, can be developed as an active process of creation between listeners and soundscape.

Such a dual process of listening and remembering suggests an interactive process. Here, people's feedback regarding the soundscape can be expressed through their soundmaking and primarily through the voice, represented by testimonies and comments about the sounds, and also by the writing, which is seen as an expression of the voice (according to Wertsch and Smith) in the process of recalling.

The soundscape of the London Underground, as regards cultural memory, can thus be understood as a framework that could bind a community through the experience with its sonic environment in both time and space. The activity of sharing individual

experiences with the sound environment could bind the London Underground's acoustic community in time, because the past, the present, and a notion of the future⁵² are tightly linked in the London Underground's materials and architecture, influencing people's everyday life at a pace determined by the whole mechanism of the public transport system. Furthermore, sharing commuting experiences could bind the community in space, because the whole activity is unified by links between the stations, lines, carriages, and rails in an architectonic variety.

On the other hand, artistic approaches have taken into account time, space and memory, either in compositions incorporating the sounds of the real world or in soundscape composition. In their narratives, memory has been the bridge that situates the listener in the space, through the interpretation made by the composer of the context overlapping spaces and time. Memory is also involved: in the symbolic experience of going underground. This experience is the accumulation of individual perceptions of travelling underground, and the elements of the Tube's soundscape such as its architectonic space, its machinery, and the confluence of people travelling within this space in a sort of ephemeral time. These make of the Tube a sonically rich and memorable space, binding people's aural experience in the urban context.

The idea for developing sensitive listening to the environment, one related to routine, is suggested here in part to promote the use of urban sound to develop people's awareness of themselves as inhabitants - temporary or otherwise - of the city. In the ethnographic work, through a listening process, the evocative nature of the sounds can stimulate a process of remembering that might contribute to experiencing and transforming personal feelings about a shared place.

The articulation of these elements establishes the foundations for the original proposal in this study of the creation of an Interactive Sonic Environment where commuters can establish a different relationship with the soundscape. It was proposed this be done through an interactive process involving the processes of listening and remembering as

⁵² Ideas of future are related here to plans for the refurbishment of stations in LU, or to the modernisation of carriages and ticket systems such as the new Oyster Card. It is noticeable how both systems are modifying the soundscape, in a short period of time, using similar sound signals such as the door signal and the ticket mechanism signal - which has been extended to the buses, too.

activities which are interrelated, one that could potentially bind the acoustic community during its creation of sound-driven narratives⁵³.

1.4 Interactivity

Within the creation of the Interactive Sonic Environment, for the researcher it is important to relate to the concepts of interactivity and interface that exist in sound-based multimedia applications, and also in experiences that take into account real spaces and their virtual representation by digital means. As was stated before, the relationship established between an individual and the soundscape is bi-directional. Truax affirms “the flow of information goes both ways, since the listener is the soundmaker”. (Truax, 2001:65) In this sense, when the soundscape is well balanced, he says, “there is a degree of information exchange between its elements and the listener is involved in an interactive relationship with the environment”. (Truax, 2001:65) This given “interactive relationship” became the purpose of this study, so as to lead to an understanding of the relationship existing in the real soundscape, and to render it dynamic, transformed by the commuters in a virtual space through a process of listening and remembering.

1.4.1 Interactivity in Electronic Arts and in Music

Two analyses of the term “interactivity” in music and sound art applications are important to mention in this research. On the one hand, Simon Waters affirms that “the term ‘interactive’ tends to be framed differently in the worlds of ‘electronic arts’ and music.” (Waters, 2000) The former, he said, “tends to privilege aspects relating to ‘individually-determined navigation’ through an experience” and the latter concentrates on “qualitative issues around the subtlety and suppleness of the interface, and of the immediacy of the system’s response.” (Waters, 2000) On the other hand, Garth Paine, referring to interfaces in music states, says that “in order for the system to represent an interaction, it must be capable of changing and evolving”. (Paine, 2002:298) He says

⁵³ It is defined in this research as the progression of the individual interactive multimedia navigation, where the combination of elements (sounds, texts and images), which inform the interactive multimedia design, is present mainly to create the sense of a sound environment that resembles the experience of the original environment from which the sound was taken.

that “multimedia systems that do not evolve their behaviour in relation to accumulated patterns of input ... are therefore not interactive, but simply responsive...”. (Paine, 2002:298) Paine suggests, following digital art experiences, improving interactivity in musical systems through engagement between spectator and the art work, and cites Krueger, who suggests that:

[T]he experience of engaging in a responsive environment involves an active engagement with each moment, and that each moment of engagement contributes to the creation of the art work. The participant does not have the option of taking the stance of a detached spectator; they are inherently part of the process, part of the artwork/instrument itself. (in Paine, 2002:303)

Both Waters and Paine highlight the interactive characteristics present in music and in artworks. In the interactive arts the user is an active part of the process, mentioned as a “participant” by Paine, and by Waters as an individual for whom it is important to experience the art through “individually-determined navigation”. In music, the interactivity is dependent, on the one hand, upon the evolution of the system through users’ input and, on the other hand, upon the interface and the immediacy of the system response.

Following Waters’ perception of interactivity it is noteworthy to relate that the two mentioned aspects of interactivity - navigation, and the immediacy of system response - are important in the interactive process pursued by this research; firstly, because the navigation involves the process of discovering a route, essential in the real space of the London Underground, and is an individual choice and experience. Secondly, because the immediacy of system response creates the sense of being in a space where experiences lived in different time and space, within the London Underground, are able to happen at the same time, in a virtual space. Furthermore, Paine’s statement about evolution can be taken into account, in the sense that the real space and the virtual space are both soundscapes that evolve.

On the other hand, Söke Dinkla (2002), in her analysis of the interface in interactive art, categorises the tendencies of interactive art work since 1973 as follows: “power and play”, “participation versus interaction”, “proximity and manipulation”, “strategies of

seduction”, “nonlinear narration”, and “remembering, forgetting, and reconstructing”. In the latter, Dinkla includes works that use different sources of contextual material stored by “the technological memory media” taken from, for example, ethnographic works and reconstructed by the user according to “the perception strategies of these media” (Dinkla, 2002). This tendency supports further the concept of interactivity described above, in which this research is based and therefore, the Interactive Sonic Environment can logically appropriate the mentioned interactive features.

1.4.2 Communities – Internet

As a background to interactive experiences on the web, it is worth mentioning the interactive experience PET,⁵⁴ which mixes sounds represented graphically in geometrical shapes that move against each other and trigger the sounds each contains. These sounds are selected in advance by the user who is able to manipulate each sound in terms of duration, tempo, and amplitude. The settings of these sounds are saved and can be edited at any time. This example is interesting because of the development of a user’s tools, and the visualisation of his/her actions in geometric shapes, although it does not exemplify work with soundscapes. The interactive process becomes a compositional process, thus the interactive experience of navigation is lost.

Another perspective of interactivity, taking into account the characteristics of the Internet, is the interconnectivity between users that in turn stimulates the creation of virtual communities. A related view can be situated in Barbosa’s notion of Shared Sonic Environments.⁵⁵ These are described as “a new class of emerging applications that explore the Internet’s distributed and shared nature [and] are addressed to broad audiences”. (Barbosa, 2003:58) He states that this approach demands no musical knowledge from the performers, yet gives the option of creating

⁵⁴ This project was developed in 2003 by Paragon Ensemble. http://www.paragon-ensemble.com/commissions/laura_baxter/pet_00/index.html Accessed 15 February 2004

⁵⁵ The approach that musicians and sonic artists have taken to collaborative systems has been categorised by Alvaro Barbosa into four types: Local Interconnected Musical Networks, Musical Composition Support Systems, Remote Music Performance Systems and Shared Sonic Environments. (Barbosa, 2003:57-58)

[C]ommunity-oriented shared virtual environments where users dynamically join and leave, supporting collaborative ongoing sonic performance based on the simple manipulation of sound objects in a soundscape or on the creation of musical structures. This approach goes beyond the enhancements of existing acoustic communication paradigms, focusing on diverse Internet collaboration. Just as similar paradigms oriented towards visual or textual communication (Multi User Dungeons [MUDs], Objects Oriented MUDs [MOOs], Internet Relay Chats [IRC], Active Worlds etc.) attend to lead to new mechanisms of interaction not usually seen in ‘real life’ [42], a similar result can be expected in paradigms oriented towards music or sonic art, suggesting that the sonic outcome of such systems could express interesting new artistic results. (Barbosa, 2003:58)

Even though Barbosa based this idea on Truax’s concept of Acoustic Community, he raises the question whether such a community is able to express “meaningful musical results”. (Barbosa, 2003:54)

On the Web there are experiences that touch different aspects of the idea of community. On the one hand, there are important experiences where users share sound and image files to create any sound and visual space on the web, as is the case with the Jamming Experience of Visitors Studio⁵⁶. This space is a platform to develop multimedia art forums. People meet at any particular time to share images and sounds about specific events that the studio invites them to discuss. The studio provides the tools to upload and remove files, and a chat room. All activities are integrated using one interface. Another way of creating community is through the use of the metaphor of the real city, creating a virtual representation of it. This is the case with Amsterdam’s Digital City⁵⁷, which “used the metaphor of a city to structure the information and communication in cyberspace and made the users into ‘inhabitants’”. (Rustema, 2001) Any resident has a space on the site and is able to visit others, create his/her own house, leave messages, or chat with the owner if s/he is present. The experience of a weblog⁵⁸, mentioned before, is an example of a textual community based on the experience of commuting through the London Underground. In the blog commuters make comments, provide anecdotes and upload pictures of their daily experience.

⁵⁶ <http://www.furtherstudio.org/live/>

⁵⁷ <http://www.dds.nl>

⁵⁸ <http://www.goingunderground.com>

The author's multimedia experience which precedes this research is the Interactive Multimedia "Metro" developed in Barcelona. (Alarcón, 1998) This is a multimedia representation of the commuting experience from the perception of the researcher, as a foreigner, during the first experience of an underground commuting journey.

The work inquires into the symbolic meaning of the underground commuting experience, based, first, on stories of the experience found in about twenty underground transport systems all over the world (Ajuntament, 1997), and then on the act of structuring virtually the experience of residents who commute daily. Chaos and control informed the artwork, as the Underground Transport System is perceived as a control structure for the people. Short loops from Barcelona's Metro are used, as are quicktime videos edited from Prelinger's archive. (Prelinger, 1996) A few seconds taken from different pieces of music are looped to generate rhythm and diversity. The space is divided into the entrance, platform, and carriage. Since this work emerged, the exploration has been in a permanent and inevitable comparison with other transport systems existent in the researcher's home city (Bogotá, Colombia) where the underground exists only in the respective memories of the residents as a possible solution to the chaotic traffic generated by the amount and diversity of private bus companies and, of course, the automobile.

The interactivity understood as a process which involves human – computer systems in a creative or communicational process has been defined and re-created according with specific experiences in the areas of music, interactive-arts, and other experiences involving virtual communities on Internet. The researcher has highlighted some of the main interactive features that can be found in the mentioned experiences and the conceptual ideas behind them: navigation, continuity, immediacy of system response, user's engagement, representation of implicit communities and spaces (cities) in the virtual space, and exchange of information between people. These are not supposed to be requirements of interactivity but important concepts that this research reflects on. The interactive options are attached to technological developments of multimedia design software and telecommunication systems. The examples shown, successful or not, have been created for the Internet. This option can be related to the "imagined

communities” defined by Wertsch, which depend on several aspects of the medium to grow and survive.

The concept of interactivity in this project, takes into account concepts and experiences mentioned above and also goes further. Here the fact that the experience of the individual with the sounds takes place first in an already familiar real space is important. It is likely that this condition strengthens the “engagement” that the user might have with the interactive environment. Thus, the “interactive relationship” between commuters and environment is first analysed in the real space, and then it is represented in a virtual space where this relationship can be transformed.

1.4.3 Interface and Interactivity in this project

The current research takes a real space, the Tube, to be represented in a virtual environment. This is an attempt to provide a different perspective on the soundscape. The interface is the structure, which takes the features of the space and promotes the sense of discovery in the proposed new sonic environment. This is addressed to a non-expert user and formed by categories of sounds that comprise the journey represented subtly by images of the textures of materials, familiar to the commuter, present in the different architectonic spaces of the London Underground. These images contain lists of the selected sounds which, when triggered in sequence, create a continuous aural image, a different perspective of the real space.

The interface provides the elements to generate sound-driven narratives within the processes of listening and remembering. It takes into account navigation and collaboration. Navigation is offered through the discovery of the sounds of the environment by way of an intuitive interface that permits the user to experience an underground journey; sounds are being triggered randomly through the user’s actions to create a musical discourse of the soundscape. For the study, collaboration concerns firstly, the sharing of experiences through meaningful sounds chosen by commuters from their respective journeys and, secondly, the expression of memories of their

journeys while they are experiencing the space. This sharing and expressing played a seminal role in the creation of the interface.

On the web, collaboration will be facilitated further with the potential for uploading sounds and images as well as written comments. Interactivity also takes into account the evolution of the sonic environment with the contribution made by commuters with meaningful excerpts of sounds from their journeys, through different lines and stations, and at different times. In this sense, the manipulation of sounds is not the purpose here, because of the researcher's wish to maintain the original sound and the relation established by commuters with the context. However, the mixture of sounds coming from different sub-spaces and times within the same structure of an underground journey is what creates textures⁵⁹ through the mixing of layers of sound (named categories).

Interactivity is understood in this research as a process that involves real and virtual context, sound and memory. These elements feed the creative process according to the responses received from commuters through different stages of the research. Technology serves the process of creation to re-experience and recall the soundscape.

In Chapter 2, the undertaken model and the manner in which the fieldwork has contributed to the creation of the artistic work are described in detail. This is the core of the research, where concepts and inferences mentioned above will be inter-related and discussed according to the participants' accounts.

⁵⁹From the EARS web site I cite here definitions of Gesture and Texture, terms that I will use along this Thesis: "Denis Smalley has written extensively on the concept of the pairing of Gesture and Texture as structuring principles in electroacoustic composition and analysis. Gesture is concerned with action directed away from a previous goal or towards a new goal; it is concerned with the application of energy and its consequences; it is synonymous with intervention, growth and progress, and is married to causality. (Source - Denis Smalley (1986). *Spectro-morphology and Structuring Processes*, in Simon Emmerson, ed. *The Language of Electroacoustic Music*. Basingstoke: Macmillan.)" As regards Texture, "[t]his visual and tactile analogy has frequently been used in describing music, and would appear to be peculiar to the English language. In its most general musical sense, the term is frequently used in a highly inconsistent fashion. It is variously used to describe vocal and instrumental resources employed, synonymous with timbre and sonority, vertical density and construction of voices and parts, interval spacing within chords, and the nature of monophonic, homophonic, heterophonic, polyphonic and contrapuntal musical constructions. In electroacoustic music, texture is a highly useful term in describing the character of sounds and various structural levels of sequences of sounds in terms of their overall behaviour and internal details and patternings. Denis Smalley uses the term, in a pairing in conjunction with Gesture, as a structuring principle of electroacoustic music that is fundamental to his spectromorphological theory." (EARS) Accessed 2 June 2006

This Chapter contains details of the different phases of the fieldwork involved in preparing the interactive sonic environment described below. The findings are given in full; the artistic work takes its shape from the results.

The research project explored the relationship between commuters and the soundscape of the London Underground, in order to create an Internet-based Interactive Sonic Environment. It was useful to inter-relate acoustic communication's soundscape concepts with contemporary collective memory studies in doing so. The researcher created a model to investigate the aural memory that commuters have of the experience of commuting in the London Underground, and developed a virtual space where these memories are shared and creatively linked together. The model combined fieldwork and artistic work, following a process of listening to and remembering with commuters. The fieldwork objective was to inquire into commuters' aural memories of the LU. The artistic objective was to facilitate the interaction between soundscape and users through an interface that allows a creative combination of sounds to assemble aural memories into a sound-driven multimedia experience.

2.1 Fieldwork

The fieldwork consisted of the three phases of interviewing, travelling and listening. The purpose of these phases was to follow a process of remembering and to have different phases of recall: a past memory, a memory in the space (during the activity of commuting), and a reflection of the experience through the listening to a recording of a Tube journey. It allowed the researcher to discover different perspectives in order to understand firstly, aural memory, and then how this is expressed. Each volunteer underwent this process individually.

2.1.1 Call for Volunteers - Journal

The sample needed was an approximate number of thirty volunteers, who were able to follow all the phases mentioned. Advertising in newspapers such as the *Metro*, *Evening Standard* or the magazine *The Big Issue*, circulated among the commuters, was an expensive option. Therefore, it was decided at first to invite acquaintances of the researcher to participate as volunteers and later, to post the invitation onto a weblog exclusive to commuters (*see* Appendix 1). These two ways were found to be the most advantageous in involving volunteers in the project.

Initially, twenty-four volunteers were involved in the first phase of the fieldwork: thirteen were born in London or other places in Britain;⁶⁰ eleven were from overseas.⁶¹ The ages of the volunteers ranged between twenty-five and fifty years old, and two were children of eleven and fourteen years old. Twelve of the volunteers were female and twelve male. The number of years' commuting ranged between eight months and forty years (*see* Appendix 2). In the second phase the number of volunteers was reduced to twenty-one, then in the third to nineteen, because these phases demanded more time and continuity from the volunteers - some of whom were no longer living in London.

The phases of the fieldwork were designed based on the researcher's own journal. She recorded her commuting experience in order to identify appropriate equipment, and the conditions that could be found in the space when recording with commuters. In the journal (kept between June and November 2003) two aspects were registered: the sound characteristics of the space, and the listeners' attitude in the recording process. The times and places of travelling were noted, too, in order to enhance perceptions of changes in the routine journeys. The description of the sounds heard⁶² gave an idea of the types of sounds found and of the narrative during the journey.

⁶⁰Commuters born in Britain: Hammersmith, London; North-east London; Manchester; Newcastle; Richmond, Surrey; Oxford; a London-born Colombian.

⁶¹ Other origins mentioned: Australia, Brazil, Colombia, Japan, South Africa, Taiwan, and Peru.

⁶² "The background in the stations located in Zone One seems to be filled with buskers' music. Machines and humans are in a continuous reverb. The steps of all passengers are interesting because they mix in a walking rhythm. The microphone captures the rhythm of the escalators. The wind is strong; I thought of Schafer's statement 'wind the natural sound that man has traditionally mistrusted and feared the most'. I think I am listening to waterfalls, whirlwinds, and whirlpools. Closing my eyes I can imagine being in another place such as a social meeting, a party, gallery or cocktail party while I am waiting on the platform. When the carriage goes deep [into the tunnel] I feel the pressure of the sounds in my ears; the sounds are high pitched. When the train stops, and we are inside, the silence is a sound event. On days such as Saturdays at 6 pm the sound changes because this is a shopping day.

Different listeners' attitudes were identified: for instance, if the commuter is travelling alone (as most commuters do), s/he keeps silent. In the silence s/he is listening to others, maybe expecting sound events, or is “tuned out”, immersed in his/her thoughts: s/he is experiencing a *background listening* (see Chapter 1, p.28). In terms of narrative, it is reasonable to think of the commuter who is the principal character as being hidden (since s/he is the observer, or perceives him/herself as passive in that environment). Sometimes s/he would suggest her/his presence in the recording by talking or making a sound: it seems that the attitude of the commuter in front of the microphone is different when s/he forgets that everything around her/him is being recorded. The most common activities noticed during the journey were: making conversation or listening to those of others. The conversations heard significantly influenced the dynamic of the journey. Conversation “makes things happen”, as Antaki has noted (see above).

One month later, the researcher returned to London. She noticed how her own perception had changed. London seemed to move at a faster rhythm than does Leicester, the city where the researcher was living. There were, in fact, *referential* and *reflective* types of listening taking place. (see Chapter 1, p.29) Through listening to the sounds there is an awareness of the qualities of the space; it is completely different in the platforms than in the corridors, or the carriages. It seemed that sometimes everything has a rhythm. At other times, all sounds within the Tube seemed out of control. Commuters tried to follow the rhythm of the soundscape by singing, ripping paper, etc. Being far from one's habitual soundscape for a period of time stimulates a renewed awareness of the once very familiar sounds.

Using a microphone to record the experience of commuting, the researcher realised that the movements of the body influenced the perception of space. For instance, when walking - along the platform, towards the exit or towards the trains - a natural mix of sounds is recorded; when standing still either in the train (strap-hanging) or on the

The sound of plastic bags is strong. On Friday nights, people seem anxious, waiting for the sound of their mobiles. The devices to disseminate messages to the passengers vary: there are megaphones on platforms and in corridors, and speakers installed on the trains, platforms, escalators, and lifts. I noticed the voices from speakers vary from pre-recorded voice, a live voice - male - and they have different accents. Sometimes they are overlapping each other; it is how information messages are contradictory. They speak as announcers, news readers, or like priests. Too many signals are heard. There are sounds like mobile signals that are just registered by the recording. I wondered how this sound is part of the private soundscape of commuters using headphones. In different lines and stations the keynotes and rhythms change.” Taken from the *Journal* (June-November 2003)

platform waiting for the arrival of a train, the microphone captures details and changes in the sound within each of the same spaces.

On the other hand, in preparing the recording of the fieldwork, the technical options were either that the commuter him/herself used binaural microphones, or that the researcher recorded the experience using a stereo microphone while following the commuter along his/her route. Binaural microphones could have been problematic, in the sense that a sudden movement of the head would radically affect the perception of the space while the commuter was listening. Therefore, the latter option (that of the researcher's shadowing the commuter) was chosen. This was done in order to grasp genuine aspects of the experience without the unwanted interference of equipment. In this manner, recording would be more “controlled” (technically speaking) and commuters could feel free in their behaviour and attitudes towards the sounds and other people.

Based on these observations the three phases of interviewing, travelling and listening were developed through taking into account the nature and purpose of the interviews, the commuting experience, and the technical aspects involved.

2.1.2 Interviewing

The purpose of the interview was to investigate the different feelings that commuters have towards the sounds, given the uniqueness of the particular experience of each and the time they have been travelling through the London Underground. Further, the researcher was interested in the ways in which they expressed their memories. The questionnaire comprised seventeen questions (*see* Appendix 3).

Commuters were asked to bring to the interview an object meaningful for them during the commuting experience. It broke the ice and brought the interview closer to their personal activity. The objects were a CD player, an MP3 player, a Brompton bike (the only type allowed at that time to be carried in the Tube), books, bags, a purse, a briefcase (a memory of the first job), an Oyster card (called a “beep” card), a

Travelcard, a diary (with a special motif of a horse which keeps this commuter company during the journey since it signifies freedom), chewing gum, the “executive maze puzzle”, a music score, a German lessons notebook, photographs of friends and family and a “virtual map”. Each item was important because it reflected, for the person who carried it, their perception of the commuting activity. For instance, the maze was loosely representative of the labyrinth through which they are travelling:

... So you've got to try and get the objects, all these objects, in the middle of the maze and it's very difficult. So it's quite useful because of my journey - you know - by the time I get to the end of my journey, depending on whether there are any delays, I might get the mole inside the maze, so you just try to get them in, like, one at time, so you try to get it inside the maze, it's very difficult. (*Laughs.*) So that would take time, so normally I do that or read. (SA)

The virtual map represented the construction of the space in the mind of a visually impaired commuter. The existence of “key sounds” to navigate in the space is described as being vital for him. One of his main reasons for moving to London was the Tube because it is “a controlled noise space” (HH). As an excellent example of *referential listening*, he describes how to navigate: he has his stick and his ears. With the stick he measures distances and touches “silent” objects; he also measures degrees of angles. He makes a continuous exercise of listening and decoding, almost anticipating the sound shape of the station. “Is it realistic?” he asks himself. He has in one *virtual* object the paradigm for all further travel through any station.

The object is a representation in my mind, of every step, every wall, every platform, all the angles of absolutely everything from the perspective of what can be touched, so I don't have a map of the ceiling because I don't touch it. But I have a map of everything that can be touched, so the walls and the floors and the steps in the escalators and the moving rubber rails on the side of the escalators. But most importantly I have a map of the layout of large stations like Euston, King's Cross, Victoria, London Bridge and I know most of the railway stations underground (HH)

On the other hand, from the vocabulary list compiled by the commuter during his German lessons, he recalled words related to public transport.

I even got *Richtung London*, which means in the direction of London ... umm ... *verletzen* which means to be injured, yeah, of course there is some vocab in here that is part of the travelling on the underground because one of the topics that we did as you always do when you learn a foreign language is how to navigate a transport system in the country. Yeah, or the German for strike which is very pertinent for the underground (*laughs*) *der Schlag*, there is a strike on the Tube next week so (RS)

The music score gave another volunteer the chance to rehearse:

I am singing, I have to memorise music all the time and I am quite always (*sic*) paranoid about music. (*Laughs*) My music ... is so strict and I am always reading music in the tube. So sometimes I - without knowing - I start to sing in the Tube, just humming ... and it surprises people and I normally read the newspaper or read music, so these are basically symbolic things about my Tube life. (YN)

Here the process of remembering personal interests is related to the activities of voicing and listening for these volunteers during their commuting. These resemble Smith's accounts about voicing, listening and recalling, as developed in Early Modern England (*see* Chapter 1, p.43). In the LU, the background sound is a new important element in the contemporary England, linking these activities.

A commuter brought an excerpt from the book *Cryptonomicon* and particularly this section:

Waterhouse and a few dozen strangers are standing and sitting in an extraordinarily long, narrow room that rocks from side to side. The room is lined with windows but no light comes into them, only sound: a great deal of rumbling, rattling, and screeching. Everyone is pensive and silent, as if they were sitting in church waiting for the service to kick off. (Stephenson, 1999:137) (NM)

He notes how he was in the Tube when he was reading this paragraph and what a strong impact it had on him when he realised that it was about the Tube experience.

On the other hand, the "beep card", an object named because of its *sound signal* (*see* Chapter 1, p.18), imparts the identity of "commuter" upon a LU user. This element intensifies her rhythm when commuting:

Also, you move faster than the others who are not commuters. Normally people who use Oyster - they are regular commuters already and with this you go/you can just touch the yellow symbol and then pass very quickly and it's kind of being proud of having this card, it's being different and being efficient, it's a personal opinion. (*Laughs*) (TC)

Other activities they carry out during their commuting routine are thinking, reading, eating, writing poetry, colouring, reading the *Metro* newspaper, playing with "mates", staring at people, imitating the sounds of the train, listening, and "trying" to talk to friends (JO). Reading is special for some of the commuters. One of them thinks that most of his reading has been done in the Tube: a book per day or per week. For another a book fills up her time:

If I am going somewhere which is not very pleasant, it can be boring travelling from A to B. I always have to have a book with me. It is my security blanket. And lots of people use that in the underground to shut others off and immerse themselves in something more pleasant than the journey. (CD)

This introduction to the commuting world gave hints of the need felt by the commuters for keeping their respective individual spaces in the Tube, or feeling themselves to be part of a strange community. They use imagination, games, familiar objects, work objects, sound and language (reading and writing) to create their own worlds and identities within the Tube. The activities are introspective and make the time pass faster. They are important because they are the tools used by commuters in responding through their thoughts to where they are. Some activities are directly related to listening, such as the use of CD and MP3 players; they are also related to listening and remembering, such as the "virtual map", rehearsing German lessons, and humming. Sometimes, engaging in the activities brings the presence of other commuters to their notice, which is when private and public spaces come together: some commuters reject the presence (of others) or feel threatened by it, while some are encouraged to re-create that shared space.

2.1.2.1 General memories

The first commuting memories recalled by commuters born in Britain were related to remarkable scenes in their childhood, youth and adult working life while travelling on the London Underground. For people born in Britain, childhood memories stood out: they consisted of journeys made during school times and mostly with family members. They recall fears and strong emotions in the Tube. One volunteer related how he was very scared when going to a religious event in London; the Tube represented for him all of the scary things he had in his mind as a boy, things for which he could find no explanation: “Just noises.” (RS) He did not like the crowd and the sound when the train was coming, and the tracks seemed very near. Other emotions are related to the above-ground experience: the idea of a long journey, in which it is possible to see through the windows into people’s houses, or the memory of the new silver train passing close to the school playground. From youth, they recall times where the Tube represented freedom and a social life, and also tragic incidents such as the King’s Cross Fire, an IRA bombing or a train crash. The interviewees described incredibly long journeys, from east to west or from south to north, criss-crossing the city.

In contrast, foreigners’ accounts about their first commuting memories were related to their arrival in London, their first impression of the city. They remembered their feelings of warmth, heat, cold, fear, and loneliness while trying to understand how this “new world” (MM) worked. Some fears were related to the speed of the train and the skills needed to travel by Tube: buying a ticket, calculating the time of the closing of the doors, reading the map, understanding the English language, and being intimidated by the escalators. Also, the fear felt is associated with superstitions of descending into the underworld. For instance, a volunteer compared her early experience of the Tube with one she had had while visiting a mine when she was a child:

In the mine, obviously, you have to go underground and usually you carry a light because there’s no electricity to go into that and there’s lot of superstitions in the mines in Latin America. They believe, in the mine, that the devil is there and they actually have a saint, the miners have a saint to whom they ask protection before they go to the mines. (*Laughs*) And I was always very scared ... of ghosts. ... But, of course, here there’s electricity, there is people and there is a continuous voice

in the underground telling you, you are here and you have to get down here and the next station is that. (SB)

Once they get used to the Tube commuters have a general perception about London and the Tube: “the Tube is a collective memory of London” (EM), one volunteer says. It is a topic of conversation for those living in London and “Nobody has nothing (*sic*) good to say” (EM). The Tube is described thus:

The underground is for me - is thriving in the belly of London, these are the arteries of London, this is where the blood flows. We look like moles and just popping out of one entrance and back down into another. We very often don't have a conception of what's above ground or the distances above ground, or how far one thing is from another. (AL)

The collective experience is described as “fascinating ... the underground people, etiquette and social behaviour”, “it fascinates everybody” (AL). In the Tube “all becomes a language”; “it is like a theatre where you can see London, in a way - of the reality” (SB). This suggests the existence of a language, making them part of both a collective memory and a “textual community” (*see* Wertsch above).

The experience of commuting is associated for some volunteers with fear, either because of danger or sad situations that can occur in the Tube. A volunteer said that as he has used the LU for long time his memories and feelings are mixed. On the one hand, there is nostalgia: the house where he grew up, living away from home, and routines in relation to his family and his jobs. Nowadays, the experience is different; he feels fear with “threats of poisoning or chemical danger” (TG) or terrorist attacks after 11 September [2001]. Another volunteer shares the same feeling and he feels safer living outside London. However, one volunteer compared commuting in the Tube with the commuting experience in her home country, and in London she feels safe.⁶³

Here it is noticeable that there are similarities in the perception of the Tube as an experience that is indeed shared. It is also linked to very personal memories of commuting - cumulative ones - and these have changed according to each person's

⁶³ These interviews of this study were conducted in May-June 2004

respective life experiences. From the commuters, we see a fear of the unknown; the discovery of a new world; memories related to their family; gaining freedom as a youth (or as an adult), and, for foreigners, looking for something familiar or learning how to navigate in a new environment. These personal memories are linked symbolically and can be related here to Eliade's "universal pattern" (*see* above) of the rituals of the descent, such as "suffering", in the case of fears, and "separation from the family", in this case of freedom gained as a youth. Unfortunately, violent circumstances are also recalled, and it is not just a coincidence that the media have taken the Tube as a *motif* through which to create films of mystery and horror, as will be recalled by volunteers later in this Chapter.

2.1.2.2 Sonic memories

The sound memories gave a more focused description of the experience either evoked by sound, or evoked by the whole commuting experience, involving sound elements in it. The sound memories were described through associations with the source or the feeling that the sounds stimulate.

For seven of the volunteers the sonic experience of commuting by Tube had no other relation than with the Tube itself, either because they had never thought of this before, or because the relation with sound could not be made easily. A third reason was because routine makes the sounds of the Tube so familiar that they were barely registered. This led the researcher to surmise that repetitive listening to this largely "lo-fi" environment (*see* Chapter 1, p.31 footnote 30) has prevented commuters from establishing distinctions among the elements of the sonic space. One of them said that when he is listening to the Tube he is merely *there*, as if flying in a "kind of nowhere" (MJ). For another, "Tube sound is just Tube sound" (YN). They also mentioned having a consciousness of being in the Tube and thinking of the sound of the underground as peculiar to that particular environment. A commuter said that in his perception, memory of the Tube is not due to a particular sound:

It is more random than that. Yeah, I've got a lot of memories, but I don't think a particular sound could invoke a particular memory. I think there are too many variables involved. How I am feeling at the time, how the environment is behaving at the time. (AL)

He follows this by saying how difficult is to talk about the experience in the Tube:

You can easily describe the technical aspect of that, in terms of tunnels and trains and having to pay tickets and going to train styles and Tube maps and so on. But there is no way you can possibly describe the influence that it has or the experience that it is and how much part of your life it becomes. (AL)

As each individual survey proceeded further down the list of questions, the commuters began to establish a more definite recall of sound memories. These memories were strong and very diverse. However, other senses, such as the sight and the smell of the Tube, were also involved. Some volunteers suggested that the sense of smell in the Underground could be stronger than that of sound in stimulating the memory; one has wondered, too, about how the quality of the air could affect the sound. One remembers the particular smell of the Northern Line:

The smell of the Northern Line which for me is exactly like *Lapsang souchong*, that is slightly burnt tea, smoky, that kind of the ancient suits, ancient smoke, which is kind of knocking around in there, gives a quite distinct smell, and that's stronger triggering those feelings that anything else, I think somehow the smell is even more, you know, irresistible in a way than sound and then the experience of the rhythm of the journey - it has a very strange effect, which I often find as if I'm nearly going to sleep but also in that particular journey. (TG)

For others, is easier at first to have a visual than a sound memory. Two of them affirm that they cannot link music or sound with a place. They talk about image memories, such as colours and light, dust, and rails. One expressed how people could be involved in their thoughts, with all of their senses apparently neutralised during the journey. This commuter loses his/her sense of orientation, and is involved in his/her own world; in this case, it is a world composed of thoughts:

Because the Tube is now ... I can hear the sounds, sometimes I am angry about the noise and sometimes I feel like, better, I don't know, I just try to hear the sound, just to escape our situation, our life, I just concentrate myself on the

sounds and - but generally, we are thinking about our life, we are thinking about what we have to do, we are thinking about so many things and then we don't see, we don't hear, we don't do anything but think. (*Laughs.*) (MJ)

When commuters were asked about sounds that to them are annoying, their responses suggested that the sonic environment is not in general perceived as being so. One volunteer finds all of the sounds interesting:

Ahh, not really, because even the sounds that are harsh are interesting. In some way it would be nice if they weren't always there, like - you know - but they are still quite interesting, so I don't want to listen to them all the time but yeah ... ok. (*Laughs.*) (JC)

When the amplitude of the sounds fluctuates — by either increasing or decreasing in volume — they are more likely to be remembered as comfortable. Some volunteers found nothing particularly annoying in the sounds: they are comfortable for these volunteers because of their rhythm and intensity. For others there is nothing pleasant in the sounds and the experience of commuting by Tube.

The opinions given about general sound memories were very dissimilar. It was difficult to discern, on the one hand, a common pattern in the commuters' accounts of relating the sounds with the commuting experience and, on the other, to determine whether the explanation of the feelings expressed by the commuters emerged from the sounds themselves, or from other elements attached to the experience. It started to be a deeply personal experience for each - and complex, eventually - as if the informants were sometimes referring to different spaces.

As the questionnaire progressed, the researcher started to ask for more specificity about sound. Then, it was possible to find more concordances and to understand the meaning of the experience in the Tube's soundscape. In order to provide a highly detailed description, sound memories have been classified into *types of sounds*, *perception of time* and *perception of space*. Commuters also talk about sounds that help people to orient themselves within that space. All of these elements nourished the artistic work created in parallel with each of the phases of the fieldwork.

2.1.2.2.1 Type of sounds

Sounds mentioned by commuters were classified by the researcher into natural sounds, people's sounds, announcements, machinery sounds and "silence". The research focused on the feelings produced by each type, such as unpleasant, comfortable, most pleasant, dangerous, or other feelings.

2.1.2.2.1.1 Natural sounds

Some similarities found in the accounts suggest that commuters search in the soundscape for ancient sound symbols (*see* Chapter 1, p.19). For instance, from natural sounds, wind, is recalled as the most pleasant for two of the volunteers, where all of the senses are related. Specifically, the rush of wind in the tunnel heard inside the train is described as the most significant sound for one person:

The general memory and wind sort of sound, it's the one that peaks the most when the Tube is coming and 30 seconds in advance it's a sort of wind sound, you can feel it, you can also hear it. That's probably the sound I associate the most, signifying that your train is coming and that's a good thing and it's also quite a nice sound. (CW)

The wind sound mentioned, a sort of - and it reminds me of caves more than anything else, whistling of the caves, mainly one in particular which is in Yorkshire, where I used to live, it's a long cave with a sort of landscape. A place that I like a lot and I visit quite often with my friends. It slightly reminds me of that, the way that produces a similar sound, when the wind was blowing far along a sort of tunnels and caves. Not the same echo, because in these caves, there it is very echoey and the underground doesn't have echo in it. (CW)

Between Wimbledon and Earl's Court the Tube stops at every station, and when the doors open sounds from nature are heard:

Because when the train is running between Wimbledon and Earl's Court it's a more suburban area, you can - when the Tube actually stops in every station and when the doors open - you can hear birds cheeping is quite nice you can feel fresh air, birds cheeping and the train isn't making a quite high pitched noise ... it's not the Tube again. (*Laughs.*) (TC)

A sense of relaxation is felt when commuters go above ground. On the other hand, one volunteer said that maybe when he was a child some the Tube sounds could remind him of thunder:

Possibly when I was very small, very young, I don't know, maybe it would remind me of thunder or something like that if I used to go into tunnels, but all the sounds I think I identify too closely with the underground now - don't further remind me of anything other than they are, because they're probably very familiar to me now and I can't associate them with other than the underground. (JW)

Familiarity with the sounds thus makes him lose the type of imagination characteristic of childhood.

2.1.2.2.1.2 People's sounds

People's sounds, however, and particularly voices, are remembered as being heard on the trains and platforms and in the corridors. These accounts have been divided into crowd, single voices and announcements.

2.1.2.2.1.2.1 Crowd

The crowd is mostly what makes commuters feel in danger in the Tube and it is generally described as an unpleasant sound. The informants have described situations such as standing at the front of the platform when it is crowded:

There was a particular time when I was on the platform and there were dozens of football hooligans, milling around, shouting, screaming, banging at the train, threatening, and that was a very bad experience. (CD)

There were also experiences with large groups of people in which informants felt trapped or at a disadvantage:

I am sure everybody, especially female, can feel it's when you hear the sound of a whole bunch of drunken yobboes getting on the Tube and especially if there's not many people on the Tube. That's horrible because you're so enclosed in a Tube train and you can't get off but it's just that for me. I just dread that, or even the

sound of twenty teenagers from school, I just don't like that because there's no way - where you can go. So I mean it doesn't obviously happen very often, but when it does happen I don't like that, I just feel like getting off. (EM)

In the corridors the sound of people walking is remembered:

... [E]scalators and the sound of feet, sometimes I used to come down - sometimes down if the lift wasn't working, to go down all the huge spiral staircases and just the sound of people (*imitates*) all shuffling along. (TG)

But you can determine where the escalators are, where the turnstiles are, as long as the tickets - the guard at the gate speaks and obviously they give the position away, y'know where they are as well, you can hear the way, the trajectory of the way people walk, so you know which direction to go in, but you don't have the trajectory just of one person, you hear trajectories of everybody, because everybody is walking in similar directions, you can do some mathematics and work out where are the walk ways, what angles are they at, you can get a lot of information. (HH)

There is also a resemblance of the sounds of the trains to military marching steps:

I think the sound of the trains are very similar to the marching steps, and it can be very military ('sha, sha' - *imitates*) and it's the order. Think: once you're in the Underground in London you belong to this big army of people going to work, going to study, going to do something with life outside there in society and you are there in that channel and you can't slow down. You have to be in the same rhythm of everyone. Even when you get off the train to change at the station, to change trains, to have to follow the same speed as other people. You can't have the luxury to stand in the middle and just have a nap or eat a sandwich. You belong to that kind of - you lose your individuality. (SB)

Here, two sounds stand out: the voices and the footsteps. Both are related to the activity of soundmaking by groups, as explained by Truax (*see* Chapter 1, p.30): an activity that implies control over the acoustic space, particularly in sport and military activities. The football fans dominate the acoustic space with their voices, acting as if in a stadium. In terms of soundmaking, they establish rules of "singing" not shared by most other commuters. The footsteps recall for another commuter an obligation to keep to the same rhythm, as happens in military environments.

2.1.2.2.1.2.2 Single voices

Diverse stories of scenes experienced with people in the Tube are mentioned: the impatience of people to have a seat; a dangerous situation with a man carrying a big knife; a drunken woman sleeping on the shoulder of another passenger; kicking a man down the escalator; playing a race in Hammersmith using trains that go in the same direction and the rail is divided; defending a foreign woman from a drunken man.

If the sounds come only from a few people, single voices and the sounds of feet, on particular lines or stations, bring pleasant company. In the corridors, too, with their long walkways, music or people heard talking in the distance can “be very provocative and surreal” (AL). One volunteer recalled a scene that happened in Holborn:

[I]t was late, there was hardly anybody on the platform and I was sitting there, virtually by myself and all of a sudden there was this very distant music floating through the tunnels, someone was playing, it was very sweet music, and then this man on the platform - which I wasn't paying attention to to start with - shuffling to the music, walking all the length of the platform, up and down, but he is shuffling, he's not lifting his feet, he is shuffling to the music ('shh k shh k shh k') like that and I noticed that he didn't have shoes, he had cardboard tied to his feet, he was homeless and probably mentally ill and he was listening very carefully to the music. And the music was sweet, and he was so mad, and I felt so lonely. (CD)

Here the importance of feeling is noticeable in this volunteer's account. Her perception was related to the “moment of sound”⁶⁴, with a mixture of sound elements. She has described different layers of sounds and distinguished acoustic spaces - *referential listening*- that have made of this experience one sonically meaningful to be remembered. She experienced also a *contextual listening* that makes part of an individual feeling. In this case, the perception of the soundscape goes further than an identification of sound signals.

There is also a fascination for listening to the snippets of conversations still going on when the train stops its sounds which makes them public, in different languages and talking about all sorts of things. Some conversations are comfortably heard as

⁶⁴ This term “moment of sound” is used here to describe scenes involving sound, described by commuters. It is almost a theatrical moment, where the attention is addressed to a mixture of sounds that creates a story with a beginning, a climax and an end. The end is described with a feeling.

background music; there are mixed languages, voices and types of pronunciation. It is also amusing to listen to a funny conversation. Others could be interesting yet distracting for commuters. A particular sound of the consonants of the British English which “stick[s] in her ear” (YN) is also mentioned. A volunteer describes the Tube in general as a good experience for her and her son. “He is excited by going there and finds it very comfortable to talk to people in the train” (SA). Other sounds, such as mobile phones with new or old tunes, are described as unpleasant.

The silence mentioned by volunteers is related to the absence of voices during the commuting hours, even if the carriage is full of people. There are several reasons for this silence: the condition of their routine, mostly individual; the uncomfortable feeling of being in a crowded space; the loudness of the sounds of machinery that interrupt conversations; and the immersion in mental-individual worlds, by listening to music, thinking, reading, and writing.

One volunteer says that as the noises come from outside, “it is maybe the reason why people are so quiet” (EM). This comment deserves a comparison here, with the rule of silence experienced in the “mills” (*see* Schafer above). The researcher wondered if the situation lived in those factories is represented in the London Underground, direct product of the Industrial Revolution. In the silence, certain human gestures such as swearing, coughing, pushing or breathing loudly, become sound events that are rejected by some volunteers, while in the middle of the sounds of machinery just high pitch is perceived and is annoying. It is described as unpleasant when people talk loudly, or behave badly; and the gossiping of women, because their voices are usually higher in pitch.

Linked to the sound made by people, headphones’ sound is annoying for other passengers because people who use a Walkman often have the volume turned up too loud. One volunteer mentions that she feels sorry for people who listen to particularly loud music, because it is detrimental to their hearing:

I wondered how those people's ears are, it hurts, I feel sorry for them, because sometimes it is really loud, really really loud, and that makes me stop, actually I realised, for example if I am reading something and I am not doing anything and I can hear that "tss tss" I always turn around and I want really know who that person is. It is something that sometimes disturbs me, that's it. (MA)

This is where private acoustic space invades the public environment. It generates the paradox that the headphone users' desire to create their own acoustic environments causes them in fact to impinge on that of others. Thompson's characterisation of listening habits with electroacoustic devices is worth mentioning here. The quality of sound is searched through the headphones, helping to define the private space of a controlled signal (*see* Chapter 1, p.29). However, the users of headphones have created their own world of music, which relates to Schafer's idea of "integrity" with themselves (*see* Chapter 1, p.29); they explained why they like to do that. Four of the volunteers use a Minidisk or CD player while they are travelling, and one of them has tried to do so. The minidisk player is for a volunteer:

... [M]eaningful because it distracts from the sound of the tracks or people talking ... it just makes the journey in the underground for more pleasant I think and you can just shut off. The first couple of months I was here I quite enjoyed the underground, it was quite new and exciting but after a while, it can become a bit much depending on what lines you are on. I used to travel on the Central Line, from Stratford and Oxford Circus, it's a really noisy track and it's always very very busy, and it's often crowded and if you have some music, you manage to escape for a half an hour and it makes half an hour pleasant, I suppose, not something quite nasty. (CW)

The MD and CD users like listening to all varieties of music on them. One of them has mentioned:

All sorts of stuff. Fairly - the first record collection, that's a kind of experimental electronic stuff and umm, some hip hop and a kind of rock stuff, so today I've listened to Black Dice record and some Claudette like hip hop anything, you know Black Dice, it's like weird rock deconstruction stuff, yeah? (*Laughs.*) (JC)

Another likes to listen to the radio, when there is a signal, and to every kind of music when he is underground - except heavy metal. Yet another usually listens to Latin-American music, to feel that she is being transported to a different world.

I think once you enter that world, you can't have your individuality in your thoughts, in your feelings, and that's why for me it's very important to have a CD because it's the only window to have your individuality. Otherwise you are in front of millions of people and if you eat you're performing, everybody is watching you. If you cry, even if people don't say "Oooh", people don't get involved but you are involved with them. (SB)

Also, she has noticed changes in the sound of the song, because the train makes the pitch of the singer higher, and then she feels involved in a magnetic effect that makes her sense "tickles in her ears" (SB). When the batteries of one informant's MD run out, he says that he starts to listen to all kinds of rhythms in the Underground. He would like to record these sounds and "make them sound musical or more structured" (JC). For these two volunteers, the soundscape has a different meaning than for the other volunteers. The electroacoustic devices create a layer of sound within the environment.

Some volunteers describe buskers' music as one of the most pleasant sounds. In Victoria there is a band that always plays there, a volunteer said. If certain songs heard for the first time in the LU are heard in another place, such as a pub (even if it is a really original song), they would remind the listener as being as part of their experience in the underground. One volunteer remembers the "strong resonance" (RS) of the buskers that he finds at the bottom of the escalators in some stations of Central London such as Covent Garden or Leicester Square.

Buskers are remembered for their good or bad performances and the variety of music that they play. One volunteer mentioned that there are nowadays not as many as there were years ago, "when they used to be more and very nice" (SA). In general commuters recalled buskers' music as comforting, if it is good and gently played, or if they play a memorable song. Commuters' preferences depend on the type of music (classic, reggae, or Latin-American) and the instrument on which it is played (voice, saxophone, double bass or accordion). For most of the informants, buskers make them feel happier and alive, making of the place not just the one where they have to catch a train. One volunteer said that in few stations the buskers' music is soft, as it is in airports. Another considers irritating any pre-recorded rhythm, "bland music" or "easy to digest" music which "opposes the harsh sound of the Tube" (JC). Some of the interviewees

complained of loud busking. Beggars playing music are also remembered. One of the volunteers mentioned being scared of beggars: “- And then ... the beggars are asking for money and playing their instrument for money.” (DO)

Taking into account the previous comments, commuters emphasised the relationships between individuals, involving a reflection about individuality and the perception of a mass, rather than a collective in the Tube. To follow or not to follow the mass (in the case of steps and voices), to avoid or not to avoid individuals (for example, by using headphones), depends on personalities. It seems that the perception of a few voices or a few steps, at a distance, allows more space for sensing individualities in that shared space.

2.1.2.2.1.2.3 Announcements

The announcements are the sounds that commuters remember the most prominently. They can be distinguished between those given for the drivers, those broadcast by a pre-recorded voice, and those given by staff members through the PA systems. Even if they sometimes interrupt a passenger's reading because they speak “too much” (RK), it seems that announcements made by the driver receive a very positive response.

[S]ounds of the driver's voice over the intercom in the train, some sounds, that can be very annoying and sometimes quite pleasant and cheery and there is a massive diversity of styles which drivers use to address passengers. As I said, ranging from very annoying to sort of quite pleasant and friendly. (JW)

Also, announcements are described as hilarious, telling jokes, friendly and sometimes “too friendly” (RK); each driver's voice reflects his/her personality and mood. Funny messages and running commentaries can completely change the atmosphere in the Tube, making people smile, laugh, and talk to each other. The experience of “laughter” and “people's murmur” in the carriage is highlighted for one volunteer as important because “you are all identified as human beings.” (CD):

[H]e was really nice and He-ey, “here we go!”, he was in a very good mood and that changes the whole attitude of the whole train because people were smiling ...

from there we had like an interaction with each other that I've never experienced before in the underground because everything is so contained and everyone is in his or her own world. (MA)

Volunteers emulate or parody the announcements made by drivers, pre-recorded voice or staff members through the loudspeaker.

We apologise for the delays in this train but of course what a useless apology because this train is going nowhere and I'll tell you why it's going nowhere - because the train in front is going nowhere, what is going? Who knows? (LL)

We apologise for the late running of this train as there's a passenger beneath the previous train. (LL)

In Seven Sisters station when the train was terminating "Can passengers please take their personal problems with them when they leave the train?" it supposed to be "personal belongings" and I was sure it was what he said, I maybe laughed, I laughed a lot and I told people I often get Tube stories, yeah, nothing that sticks in my mind. (NM)

This train is ready to depart.

This train is now departing - can you please move away from the doors.

I need to close the doors - can the passengers please move away from the doors.

Could you move away from the door? I need to close the door.

Could the idiot who is holding the door please get away so I can close the bloody door? (CD)

Sometimes drivers say silly things like "Enjoy yourselves" or "I know this is not Paris but ...". (CD)

On the other hand, the pre-recorded announcements may have a less positive connotation for commuters. One volunteer stated that when she started travelling by underground, she felt that the announcement was

A kind of companion, that kind of protection, kind of angel talking to the microphone (laugh). Of course angels don't have very nice voices in London. (Laughs.) (SB)

This “voice” is mentioned by other volunteers and adopts different names in their accounts; they call it *people, them, little woman, angel, or company*. The voice is described as comfortable because it affords them company, or it is funny:

I like it when the people speak, to tell you when the next stop is, things that someone if you are alone and - and no one is around you, it feels like someone is there with you. (DO)

Along religious lines, one volunteer associates Tube announcements with Church PA systems, megaphones and, in general, with voices coming from unknown places:

Like, I used to be scared of loudspeakers and just voices coming from places that I can't determine where they are coming from - even at church, when I'd never heard a PA system, just used to scare me, the megaphones - even in the country. If I can hear that, loudspeakers scare me. So yeah, that - it can remind me of those things I can remember from the Tube. (RS)

They relate anecdotes such as coming back home and being trapped late at night in the underground and with the threatening voice of the loudspeakers saying, “This is the last train ... you must exit the station, the station will be closed.’ We were panicking - it got to the point that we really were worried that we would be staying the night in the train station.” (DS)

Particularly annoying are the prohibitive messages such as “Smoking is not allowed”, or “Don’t do this” (MJ), and the one mentioned by two commuters: “Busking and begging are illegal. Please don’t encourage this activity” (CD) or “There are beggars in the station. Please don’t give any money to them” (JW), which they think are “offensive and outrageous” (CD), also “harsh and authoritarian” (JW).

This idea of authority is also mentioned by another commuter, who says of that “angel” which, at the beginning, was guiding her movements in the Tube has in recent years become like a divine instructor:

I think I am starting not to like this angel that tells you the time, the stops and everything because I feel like a robot, like you are told exactly what to do and especially the voices are very commanding, like an authority out there. This angel has become a God after all these years and I’m tired of it. (SB)

In that sense, the announcements are interrupting sounds and move “the way of thinking”:

Aaah, when I am thinking about something, anything, the speaker start to talk and then it just moves my way of thinking and then I don't like it. I like when I am thinking, so. (*Laughs.*) When it changes my way of thinking, I don't know, change anything in my mind. Then I feel annoyed, I don't like it, the speakers just annoy me. (*Laughs.*) (MJ)

One of them said that the disembodied voices are now more Americanised, such as in Covent Garden in the lift: a “very American type airport voice” (DS), which indicates where you should go. He finds it scary, as in the futuristic films “when nobody has a brain anymore.” (DS)

Comments above raised Schafer's conception of loudspeaker (*see above*), as a device to dominate the others' with one's own voice, in an explicit manner. The authoritarian characteristic is also perceived in the repetitiveness of the pre-recorded announcements and the information that they spread, which could be very unpleasant for the commuters. One volunteer feels annoyed when a special announcement interrupts his music, because he has to switch off and listen to what the announcement is saying. The announcements constantly interrupt the activity of reading, too. One informant feels interrupted all the time, not only in his reading, but also in his thinking, especially by the announcer on the Victoria Line:

Umm, the only thing that change - that interrupts my thinking when I'm reading or ... is the announcer, yeah, they, some of them, especially on the Victoria Line, it's extremely weird, a very weird ways of saying the names of the stations and outside of that the only thing that stops me doing, is the Tube volume when I am trying to have a conversation with somebody. (NM)

A particular offensive announcement is mentioned which “was very high tuned” (JW). The offence was taken against the sound rather than the message. Sounds of people “shouting” over the PA systems and beeping could produce a feeling of fear.

Some of the informants have noticed changes in the announcements, such as the fact that the security alerts were dissimilar to the ones they heard in their childhood. The

sheer repetition of these announcements can numb the listeners' sense of awareness of dangerous situations. For instance, the warnings about IRA bombing threats and announcements such as “look out for suspicious packages” are recalled by a commuter who affirms he had never felt at risk of them:

There were things like “look out for packages”, I think it’s still, IRA bombing, there were definitely IRA things going on at the time. So you had that thing of looking out for packages, but I’ve never felt that particular sort of a risk. (TG).

Particular announcements are recalled such as a “posh fifties lady’s voice ten years ago” (DS) announcing the next train station. One informant recalls an announcement at King’s Cross last year when it was overcrowded because of the Central Line closure.

I’m not a huge fan of hearing the announcement at King’s Cross ... all the stations as well, which, it’s probably not really sound, it’s just someone talking, but that happens a lot when the Central Line was down last year - we used to get to King’s Cross once, twice a week, overcrowded, and I think there was an alarm sound in the background that was quite a soft thing and was extremely annoying. (NM)

Busy situations when more announcements come at the same time through the various PA systems are regarded as annoying; this may be on Friday afternoons or some mornings. Also, they recall other amusing, new announcements talking about “tourist attractions”. (EM) The *soundmark* “Mind the gap” is recalled with affection, as a favourite yet almost unbelievable sound. It is “unique in the world, the huge gap existing between the train and the platform” (LL). It is described as funny and is broadcast mostly in a male voice. In Bank station, a commuter said, foreigners are amused by it. One volunteer feels sad when it is not repeated often enough. One commuter used it to make a joke one evening, saying “Mind the rat” (MA), looking at a mouse that was running around the platform. In Holborn, “Mind the gap” (MA) is regarded as very loud.

Announcements are, of course, meant to be helpful sounds, for instance, the recorded voice or the “tape” that announces the next station, and those indicating alternative routes in the event of a signal failure because there is no mobile or radio reception. Unfortunately, some of them are impossible to hear, because the sound of the speakers

is not clear or because of the sound of the train is too loud, or both at once. Most of the interviewees complained about the broadcasts as always being muffled and with very low-quality amplification. They can bring a sense of insecurity to some of the commuters, partly because announcements sound very authoritarian when giving a warning - yet are still unintelligible.

The announcements given by the pre-recorded voices are remembered as impossible to understand (because of the language, for the non-native speakers), even just the words “thank you” or “cancellation” (MJ). One described how she felt a “listening shock” (MA) when she started to understand what they say. A member of the LU staff in Victoria is remembered as helpful: he is often speaking on the escalators.

Overall, the announcements are the sounds that “provoke” more responses and interaction with commuters. This is a link that identifies the “human” behind the Tube. There are very different interactions that arise, depending on whether it is with a pre-recorded announcement, on the one hand, or with a driver's or a live voice. The relationship that commuters establish with the electronically amplified voice reflects their attitudes against authority. Here the phenomenon of “schizophonia”, coined by Schafer, implies for the commuters’ two feelings; firstly, they feel aggression when they hear pre-recorded voices. These voices have been recorded with certain particular elements subsuming cultural features, such as accents, rejected by commuters. Secondly, they feel more comfortable with drivers’ voices - amplified “live” voices, more “human”, thus they maintain the spontaneity of daily life. Announcements constitute a shared acoustic feature that becomes a subspace within the soundscape; they could thus be understood as a sound symbol.

2.1.2.2.1.3 Sounds of Machinery

The repetition of the sounds of machinery makes them easily memorable for commuters, most of whom have described sounds of machinery through vocal sound

effects. For most of the volunteers, the memories of sounds of machinery were recalled as important elements of the soundscape because they produce rhythm.

2.1.2.2.1.3.1 Rhythm

Rhythm is mentioned as the most pleasant “sound”: when the sound “is not just sound but rhythm”. (MJ) The rhythm gives feelings of confidence and strength, and the repetitious sound compensates for the notion of being “stuck” with all these people, the informants said. Three of them also described the cycle of the Tube as a cycle that “goes up (accelerates) and goes down (decelerates), then the mechanical voices and at last the door” (EM). Also, the whole process of going from the outside world into the underground and entering its rhythms is a cycle. One volunteer said that this is reason why he does not need music in the Tube. Several informants mentioned the rhythmic sounds made by the wheels on the tracks, “like a battery [referring to the Iberian word for percussion sounds] or samba” (MJ), or its repetitions of “shhh, shh”, which they describe as pleasant. The sound of the train is compared with a washing machine cycle, a regular cycle every three minutes, and then it starts all over again (LL).

Specifically, the noise of the trains' wheels on the tracks is the most pleasant sound for one of them. The sound and the visual experience of automated walkways that link certain sections of the Tube, for example, in Waterloo (JW), are also perceived as favourable. The steady beat of the underground on certain lines “blocks the ears” (LC), yet it is also recalled as relaxing and “sleep inducing” or a sort of “lulling lullaby” (TG). Other volunteers said that the strong beat, “although very militaristic” (SB), also induces sleep. The rhythm is compared with the one of the trains that goes to Leeds which, too, is soporific; however, in the Tube the sensation is different, because the sleepiness is more “a result of warmth and tiredness than rhythm” (CW). The rhythm of the train also reminds one of them of times of taking drugs and dancing.

The sound of the escalators is significant for some volunteers, who referred to “the relentless noise of the escalators”, and “the non-stop flow of humanity passing through

that tunnel” (CD). The escalators have a smooth noise, they said, or a different noise, “maybe because are about to break” (LL). In the escalators, one of the volunteers feels anxiety: he says that he does not know whether to wait, walk up or walk down. There is an element that makes him feel that he has to go somewhere: the escalator is moving, thus he has to move. The escalators are also recalled as being very old with the “rubbing and jarring metal on metal” (LL). It is described as “a horrible sound that really hurts” or as “the most horrible sound” (LL) that a volunteer perceives and therefore tries to pass through as quickly as possible.

This perception of “rhythm” is comparable to Schafer’s description of synchronised soundmaking and labour. While before the Industrial Revolution human sounds accompanied “labor” (*sic*), with the introduction of machinery voices went “out of sync”. In the LU (a direct product of the Industrial Revolution), machinery interrupts the body's walking rhythm; this provokes a feeling of anxiety for one commuter on the escalators. The rhythm belongs to the activity of commuting which can be interpreted in Auge’s words as a symbol of modern alienation [metro, job, sleep] (*see* Chapter 1, p.47). Machinery this time governs the activity of commuting and the human body develops, through familiarity, an attachment to it (as happens in factories). In contrast, the voices of football fans’ chanting and the crowd’s footsteps (mentioned above) also, for some commuters, establish a rhythmic pattern. An individual may feel uncomfortable with it, since the notion of belonging to the group is not shared. Again, the need to control their own rhythms is expressed by commuters, along with the making of conscious decisions to listen - while maintaining respect for movement and thus soundmaking within a daily routine associated with travelling to and from work.

2.1.2.2.1.3.2 Between noise and music

Sounds of machinery, creating a barrier between people, are a powerful feature in the soundscape; their repetition involves people in a dynamic journey that can go from being the most terrible experience with noise, at the one extreme, to the perception of the soundscape as a musical or sonically pleasant and meaningful, at the other.

Commuters described the trains' sound extensively. They articulated the feelings related to the movements and sounds of the train, firstly, when they are waiting for the train in the platform, and then when they are inside the train. All this is part of what one of them called “the performance of the train” (SB); this they appreciate yet also perceive as strange because they are not spectators, they are involved in that performance, and also their body becomes a part of it. The sound of the train in the distance, about to arrive at the platform, creates an awareness of a loud noise descending upon them. They experience *referential listening* since volunteers connect this sound to a measurement of distance. The sound of electric currents is described as a distinctive sound, “like metal being banged together” (RS). “The occasional rumble or sub-base sound, that means movement even below the human hearing” (HM) is sensed. It occasionally becomes “surreal because of the echo effect” found in some of the tunnels (AL). For one commuter the train approaching the platform above ground is not a very pleasant sound; it is described as if the train were bringing with it all the sound of its journey (LC). When it is underground there is a more refined sound. On the platform, the sound of the Tube “coming, joining, loud and amplified” (NM) is mentioned. For one of the commuters the “feeling of the underground train arriving on the platform is slightly scary” (TG). The last description of a train’s sound includes feeling attached to a movement (event) of the train. This aspect is taken into consideration by the researcher because the feeling describes the “moment of sound”, rather than its acoustic properties, or the awareness that commuters have from it.

Inside the carriage, the train sound is described as a “rare sound” (LC). The train runs so fast and so loudly that the noise of the train is overwhelming, “metal to metal” (CD), but “the music is nice” (MJ). Then, there are “screeching sounds”, the “screeching sounds like old taxis” (DO). The informants talked about the very loud screeching of brakes and the ventilation noise, which is very noticeable both in winter and in summer; in addition, there is the sheer speed of the train. The bells and the speakers, which need maintenance, one volunteer said, interrupt activities on certain trains. The “noise of the train” (LC) when it goes through the tunnel, and the very different sound when it comes out above ground “where it’s opened and brighter, it wakes you up” (TG), are recalled.

When the train decelerates fast, it gets “this lovely push but backwards” (JW), another volunteer said. The gaps existing between the particularly intense spells, “it’s the (pshhhhhhh) that moment”, where noise is not perceived produce a comfortable feeling and “it is not the sound” (JC). When the Underground is full of people it is too noisy and one volunteer said there are no more individually identifiable sounds as such. It is difficult to enjoy the Underground, especially in the rush hours (around 9am and 6pm). It is stressful trying to talk to someone in an especially noisy carriage. Another volunteer remembers that when a very loud noise occurs its violence forces him to stop any conversation. Here the similarity (and the importance) of the wish of having a conversation mentioned in historical accounts by Ackroyd (*see* above) is noticeable.

The awareness of a sound is related both to the physical sensation and to the emotion that it brings. In the Hammersmith and City stations, the doors' mechanism makes an intrusively loud hissing noise, and when a passenger is nearby “it hurts your eardrums; that’s very unpleasant” (JG). The repetitive sound of the doors’ closing and their warning signal are irritating. However, the sound of the doors’ opening is remembered by one volunteer with great affection: “some that like a buzz when stops and takes the air out”. (DO)

When the train stops and starts again, “it is very ugly” (MM). One volunteer said that she wants to get out. The sound of the wheels as the train begins to move makes her somewhat nervous. A sound that makes commuters feel as if they are in the greatest danger is the banging noise produced when the train is almost jumping along the rails, jolting in the carriages. Sudden loud noises increase the common nervousness of travelling, they said. When the train slows down or accelerates along the platform, it produces a feeling of insecurity: some informants fear that harm is about to happen. The noise made by the Tube when the electrical currents spark along the rails, the sound of air pressure heard next to the door, the screeching, and the high speed make volunteers sense danger, giving them the fear that the train is going to crash. Particularly since the Chancery Lane accident, one volunteer said she has been frightened by a squeaky sound on the Central Line. Another expresses a feeling of panic nowadays, given the current political situation. Thus, memories of sound are expressed by feelings attached to the

machinery's movement, such as doors, train's acceleration, deceleration, rails, high speed, and failure. Also, threaten of public disruption.

Commuters develop in their respective daily routines their own attitudes towards these sounds and the unpleasant feelings that may be induced. One volunteer said, however, that they are predictable sounds; if they were unpredictable, they could be a terrifying experience. This feeling is attached to the routine where the listening attention can be described as *background-listening* (see Chapter 1, p.28). This is how commuters related they became used to "ignore" LU's sounds. One person realised how he remembers from his routine just the sound of the trains - even if he knows that there are more ambient sounds in the Underground. A volunteer stated that since she has got used to the noise, she now ignores it. Within this "ambient" sound, a volunteer recalled a *keynote sound*: the sound of air-conditioning that, during the hotter months, used to be in the background. The sound was a constant presence, on which he commented: "it seems to be a defeated sound object because it is working to its full extent" (JW) and is creating more heat than it is cooling. Another volunteer knows when a - for her - unpleasant sound is coming and she blocks her ears, almost automatically. For another, the screeching sound does not cause much interruption, because he has become accustomed to it.

One commuter has mentioned the consistency of the sound: a "white noise" (LL), as if she were trying to tune a radio and were between wavebands. This comment is linked with Thompson's statement about listening habits of consuming "new electroacoustic products" of the modern soundscape such as "...radios..." (see Introduction p.4). In this case, the volunteer's description highlighted the difference between "noise" and the "search" for a recognisable signal in the LU's soundscape. This "consistency" of the sound can be similar to the sound and sensation of the vacuum left by the train, perceived by another volunteer. She, in turn, has identified a signal: a tinkling sound next to the cabin of the driver, robotic yet not high pitched - it is described as "something to do with communication" (EM).

Certain sounds are vivid in their memories because they evoke and revive feelings of situations experienced when these sounds happened: one commuter said that a deep boom means for him splitting up with a girlfriend (HH); when he hears that sound he always remembers that situation. Furthermore, there are absent sounds, such as “the sound of the wheels of British Rail” (LL). In the past, “the older trains on the District Line were noisier because the windows were open, the track noises were more prominent” (JG).

One volunteer mentioned how the train drivers call the Tube “the Pipes”, and it makes him think of the Tube as a group of “big long pipes that sing their own notes” (HH). There will be very low frequency sounds going through that tunnel, he comments, alongside the fact that they could be subliminal.

Commuters talked about the relief felt when the train goes above ground, and there are the combinations of the sounds of the trains passing one another, fast and slow trains, and the brakes of the trains that are stopping. They recalled the regularity of the Northern Line, its speed, and how the track emerges from the tunnel before it arrives at Golders Green station. When the train goes above ground and the trains are shunting at Paddington, it “is peaceful, quite nice” (JG). It is recalled as being comfortable when the passenger comes above ground because, as there is also a visual experience, “you can see things at the same time” (TC); the train is slow and rises smoothly. Changes in the rhythm are mentioned as comfortable: the train decelerates, halving its pace, and the sound of tracks makes them seem to go slower; then suddenly the sound opens out into a bigger area. As a form of relief one commuter explores the ambient sounds, such as the sound of the tracks switching at Stamford Brook. Commuters in these cases have experienced Truax’s *listening in search* and Schaeffer’s *écouter* (see above) since the source of the sound is identified and recalled as important for them, in a precise moment of their journey. Also the sound of the train, when it is above ground, brings connotations of nostalgia that resemble the historically “memorable” noises of “accelerating suddenly...the slowing again...the rattling of coaches” described by Schafer (see Chapter 1, p.21)

The perception is different when the commuters are outside and away from the machinery; they remember past times, and they compare and contemplate trains. Recently, the trains have become more modern - newer - another volunteer said. She remembers that in 1991 they seemed very old and were sprayed in dark colours. In winter it was very ghostly, as in a film from the 1960s. If she saw a train dating from 1991 she could spot it and say "that's my train" (SB). Volunteers recalled times when the LU had smoking carriages, and when they were trying to find a seat in the non-smoking carriages. One volunteer has a fascination for trains coming from different directions in Wimbledon station. She also likes Vauxhall, because from the platform she can see the Eurostar passing and hear the sound of the engine. First, it is clearly heard without her being able to see it from where she may be, just on her way up the stairs of the underground. When she emerges onto the station concourse, she can confirm that it is indeed the Eurostar.

The sound of the Tube when passing underneath other urban sites is also remembered by their occupants: in a house where radiators used to vibrate every eight minutes when the Tube was passing, this was remembered as a "nice sound" (CW), as was the sound of the Bakerloo Line running underneath an office toilet, located in a basement.

The accounts above have described the London Underground soundscape as a contemporary urban soundscape. In one journey, commuters can experience changing environments where they search characteristics of a "modern soundscape" as explained by Thompson, e.g. establishing differences between noise and signal. They can also encounter the memorable sounds of pre-modern times. Furthermore, it is possible to suggest here that the sound of LU permeates the city, making of it an aural urban referent not just for commuters.

2.1.2.2.1.3.3 Ticket machinery

For passengers, the relationship with the ticket machinery is a fast and a functional relationship and more functional than with the train. It "counts" their presence when

they enter and their absence when they exit. A volunteer enjoys the ticket machines; when the LU staff ask for the ticket and people apologise or tell lies, she laughs at it. In the ticketing area, memories are focused on the gates. Turnstiles and gates are recognised as possessing “very distinctive sounds” (HH). Other memories mentioned the movement, which starts when they insert the ticket then remove it as the gate opens. In contrast, the sound of “clattering barriers” (NM), the opening and closing of the ticket barrier, is recalled as being unpleasant to hear. One user hates them because they are “too loud, intrusive and sudden” (NM) as the “span sharply slams open” (NM). The sound of the Oyster card is a new *sound signal* incorporated in the sequence of sounds in this particular space within the soundscape: the “series of little beeps” (JC) of people inserting their Oyster cards into the readers. Then through the gates and slamming noises of doors when they have not opened fully and then re-open and smack. The signal of the door and the sound of the Oyster card are remembered as being functional for some of the informants. A commuter who stopped commuting ten years ago said that he is “less conscious of the sound of new ticket distributors” (TG).

2.1.2.2.1.4 Comparisons

Comparisons with other transport systems linked other commuting experiences and extended the meaning of a shared urban experience, realistic or idealised. The experience in the LU underground soundscape becomes extended, because of comparisons made including technology, architecture, and missed or absent sounds of people (e.g. announcements, music performers).

The Circle Line is compared with the Berlin underground - it is mostly above ground; it is also considered somewhat similar to the Sydney metro. The sound of the Jubilee Line is compared with a very modern aeroplane on a journey to Korea: this is remembered as being “the same sound” (MM). The researcher asked a volunteer to compare the sound of the “beep card” in Taiwan; she responded that it is not same machine, as even the colour is different; she added that the Taiwanese card is more sensitive than the British version, “so in Taiwan you don’t need to take it out of your bag” (TC). The Taiwanese

metro is very different, mostly above ground. It is very similar to the Athens metro; both transport systems have been designed by the same company. Surprisingly for her, when she went to Athens she realised she could operate the machines without knowing the Greek language (and therefore the instructions), and that the design of the whole system is very similar. In Madrid and Paris, people often go to play music in the Tube, and this does not frequently happen in London. The Tokyo underground is quoted as having many more announcements than does the London Underground. On the other hand, one volunteer said she wished for a very smooth and silent train in the future.

2.1.2.2.1.5 Silence

Silence was classified here as a meaningful "sound" in the commuters' accounts. Commuters fear the silence felt in the carriage when the train stops in the middle of a tunnel. One aspect is the fear of being trapped without oxygen; another is that the train following behind might not stop. Silence is also described as a very annoying "sound" because it is "a pensive moment" (MA), simply a waiting for the announcement, and silence interrupts the train's movement; however, when the journey starts again the commuters go back to their activities.

[T]he most annoying noise I've heard in the underground is silence because it means you are not going anywhere, eh, which for quite a bit I can assure you we were, probably that is in reverse of the answers you are looking for but it is probably what annoys me the most. (JG)

In contrast, silence was also mentioned as the most pleasant for one commuter. It is mentioned as an "amazing type of silence" (HH) heard once at Highgate Station at 5 o'clock in the morning while he was waiting to go to the airport:

Umm I think of a sound that is even better than that. And I heard it in Highgate station. It's totally quiet. You come away from the surface where there's the busy A4 road and people come off down that motorway. It's a lot of traffic and you go down into a really deep station. You go down and you stand there and if there are no trains coming out that way, you know, for a long time, you stand there in a total silence. And once I was there at 5 o'clock in the morning because I had to catch an aeroplane and I was there, it was really early and there wasn't one person at the station and it was an amazing silence, an amazing type of silence. That's the best thing... (HH)

There are periods of complete silence, but they are rare, he said. Silence is enjoyed also by other volunteers when there is a very distant sound of the train coming down in a tunnel; for example, at Finsbury Park, it takes one minute. Still, this feeling could change if he were in a hurry: waiting for two minutes it seems an eternity. When he is alone and there are maybe very few people there, if any, it can be relaxing yet quite alarming. The sensation here could be related for the contrasts established between noise and silence.

2.1.2.2.2 Perception of time

In the Tube, volunteers have said to have experienced a feeling of “timelessness” and “absence” (LL). A volunteer mentioned how this experience is “devoid of time or place” (LL) because of the lack of natural light. On the other hand, the amount of time spent in travelling makes the memories “blend together”, and they are not easily retrieved. All of the senses are “assaulted by being in such close contact with these strange people” (LL) and the experiences merge into one amorphous whole lacking reference to a particular time. One of the volunteers mentioned having “a sort of a bank of experience” (NM) of sounds as a result of his routine; it contains generic and specific sounds. Changes in the equipment or in the attitudes of people would cause them consciously to notice a change of time; not only sounds, but also smells, colours, and the “landscape” of the underground stimulate a change in the level of perception. Two volunteers mentioned how the situation has changed since the fire at King’s Cross. The attitude of people is different, and there are also changes among the different seasons: when it is very wet, or when it is windier outside. In the last few years, people's behaviour has altered from being very polite to being very rude, even desperate. Another volunteer notices that after three years of living outside of London, the sounds of the LU, wherever he may be, are no longer part of his soundscape.

When specific dates are mentioned, some volunteers remember their first time travelling in the Tube, and whether this was a particularly happy or a sad experience. Some of them recall in general times such as at Easter or at Christmas, when at the entrances

choral groups “have different tunes and they are trying to make it sort of happy” (SA). There is a mix of shopping, buskers, and people laden with bags, hurrying. One commuter remembers when the driver says “Happy Christmas” or “Happy New Year” (RK), and people laugh in the carriage, creating a good atmosphere.

They also recall deeply personal experiences evoked by sound and attached to activities they used to do in specific years or at specific times in their lives. The sound of a busker at Old Street reminds one volunteer of the job he was travelling to and from, and of his first time in London. The automatic voice of the woman who announces the stations' names on the Northern Line trains always reminds one commuter of the year 1999, for him year of conscious awareness in London when all his emotions “switched on” differently to previous times in his life (HH). Whenever he hears this voice he remembers that year. Certain noises such as beeps remind another volunteer of happy times with her family. Yet another volunteer describes life in London as eventful. Certain stations remind one informant of people whom he had met there and will never see again, or of memories of a Friday night in Piccadilly Circus.

The music - rather than other sounds - heard in the LU reminds some commuters of specific periods in time. One volunteer said that the sound is weaker at triggering memories than is music, which gives her many visual images in her mind. The *déjà vu* effect is mentioned when walking through a walkway or a tunnel, depending on the source of the sound.

Commuters do not commonly share chronology about sounds heard on the Tube; merely common periods such as Christmas. Memories of events that happen at a specific time are, in the main, part of individual experiences. However, it is within the links between eventful fragments of routine that memory can be shared, reflected and transformed.

2.1.2.2.3 Perception of space

2.1.2.2.3.1 Surroundings

Commuters talked about the surroundings in the Tube. One commuter related that his father had lived in the 1960s in London; he recently returned from South Africa and thought that the LU was the same as it had been thirty or forty years ago. As regards the space, one of them thinks the sound has a relation with the “décor” (SA) of the Tube: a bright station is peaceful and feels homely while others are dingy, and unpleasant. One of them claimed that Westminster is one of the nicest stations; Angel was dark, but now it is bright and quite beautiful - it looks more modern. There, a volunteer said, in the olden, days they used to be buskers, because it was near to the market [she does not specify which]. One of the volunteers mentioned that he avoids stations with bad memories of unpleasant jobs or the feeling of being "drowned" (MA) on the Northern Line.

When the atmosphere is very peaceful, such as on the platform, passengers find similarities between being there and other places, such as large, enclosed spaces, tunnels or an art gallery, because “there is a feeling of expectancy in the air” (HH). At the weekends “there is no difference with the sound of a bar” (MA), when people are drunk and dressed up. “This is a wonderful place to watch people from all over the world” (SB) where people are switching off or sleeping; there may be someone breathing deeply, yet once the train doors are operated the sound disappears.

The Tube is also perceived as stiff and serious; it has many posters, and is aggressive, sweaty, uncomfortable and artificial:

The Tube is “a kind of geometrical environment where there are no mobile phones, ... and is a whole world ... an artificial environment without concessions to ameliorate the concreteness of it, the manufactured sense of what it is. (AL)

At the same time,

[Y]ou've got all these sweetie frustrated individuals ... you get all the spectrum of human beings from beggars to mothers with children; business people rustle their newspapers, trying to turn it and they can't find space. (LL)

Within the experience of commuting, informants have mentioned that this is a place of depression, through their being in a place full of people where they cannot relate to anyone. In the Tube more than in any other form of transport, a commuter has the feeling of helplessness, because he is "cut off from the surroundings" (DS) and without mobile signal, he feels in a complete isolation. "There is fortunately phone reception on the Hammersmith and City line." (DS) A commuter mentioned being a bit worried for her safety in the Tube. Claustrophobia and panic attacks are felt in the rush hour as is anxiety on a "temporary basis", along with the acceptance that being in the Tube is simply "as it is". (MA)

The absence of signals from the above ground surroundings and the anxiety produced by an artificial environment suggest that the perception of soundscape experience goes further than the attention devoted to certain sounds and situations. The experience here is described as full of emotion. The feelings are not necessarily triggered by sounds but by the space that the sound creates. It is the feeling produced by a whole space shared with unknown people in particular times controlled by the commuting activity.

2.1.2.2.3.2 Body

Three commuters, all of them women, established a relationship between the Tube and their body. For one of them (CD) her body does not like the movement of the train, hanging on, suspended; she prefers something smoother, like the Eurostar train. She feels this also because in the LU there are darkness, sweat, heat, and the stoicism and the proximity of people. She does not consider we were made to travel in that way. She travels in it because it is fast, but she finds it very uncomfortable to travel by underground. Another woman (MA) relates how sometimes she wants to get off mainly because of the physical circumstances of being in the middle of a crowd. The third one

(SB) said that the train becomes “an extension of the body and when it stops is like if the body had stopped” (SB).

The sense of the body being interrupted was addressed previously in this Chapter (*see* Rhythm, p.84), when a commuter described his feeling when walking on an escalator. In this case, the human body is equally attached to the machine, although in the case of escalators, the commuter has more freedom to continue his/her own rhythm.

However, the Tube may constitute a place of freedom for some commuters: to write poetry about the underground, and to enjoy the last moments of freedom before being trapped in an office. It is a place of excitement, when catching the train exactly on time or from the rattling of the train connected with the feeling produced by getting the first job in London. The informants mentioned lust experienced when they looked at beautiful people in the underground; anger at the delays and inconsiderate people; irritation and laughing at the *potpourri* of music played by gypsy children (travelling communities); anxiety when the platform is crowded; and pleasure when joining in the chanting around international football matches or when having competitions for fun with friends on the escalators. Here, the soundmaking in groups is described as an enjoyment of the space.

For one commuter the London Underground counts even more than his family in terms of the time he has spent there. “It isn’t just commuting”, he said: he has spent part of his life there. The LU is the method by which he can get around and thus gain freedom. He calculates that in seven years he has made “five thousand journeys or more... six, seven, eight, nine journeys in separate trains”. (HH) It is also liberating for him because in the underground he can get off anywhere and feel free. This feeling could be interpreted as *dérive*, or multiple options to navigate the city.

The feeling of freedom, for some commuters, contrasts with the feeling of being trapped in that underground space. The variety of stations causes that feeling to change. Here a doubled perception: how the space is structured architecturally, and how commuters create their own spaces given their relationships with other passengers and all of the elements of the soundscape described above.

2.1.2.2.3.3 Lines and stations

In their cyclic nomadic activity (*see* Chapter 1, p.49) the commuters recalled particular lines and stations. There is a fascination of being taken from one station to arrive in another within one minute. The sound of the lines holds greater familiarity than do the sounds of respective stations. The informants said that some lines are “more lively than others” (SA), because of nearby tourist areas, or crowds of school children. Another difference was perceived in the sound of the lines depending on their direction: going south or going north. There are particular references to the Victoria Line, recalled by five of the volunteers as being particularly noisy and fast. One of them has proved that if he sits at the front of the carriage there is less noise “because it builds up behind - each set of wheels makes another sound” (TG). The Piccadilly Line is also fast and is described as having “supersonic speed like in films” (LC). The Central Line is described as having an “extremely noisy part around Bank travelling from Stratford” (CW); they are “horrendous sounds, scary, from a horror film” (CW). Another volunteer describes how it is possible to hear every “crack in the track” (LL) there. There is also a “vivid” (JW) rattling sound at Stratford when the train emerges from under ground into the open air. The Jubilee Line is remembered because of its “evocative vacuuming sound” (LL) and it is compared to an aeroplane because of the feeling of floating and feeling of “butterflies” (MM) in the stomach during a journey there. A very annoying sound produced by the brakes of the train is identified at Baker Street, on the north-bound Metropolitan Line: “it’s the most terrible sound on earth; it’s awful and so loud” (NM). It is impossible to hold a conversation because of the “rattling and smashing” and then “the brakes” screeching: “it is weird” (NM). A pleasant sound is noticed in Wimbledon station on the District Line: it is the change in air pressure, where it is “possible to feel the weight of the wagon and trains coming from different directions (left to right, right to left)” (TC) not stopping, passing at a normal speed, this intersection between trains causes a physical sensation. A too noisy and busy journey from Fulham to Bayswater, and a very “high pitched” (MA) noise which produces earache in Paddington when using the Bakerloo Line, are also identified.

2.1.2.2.3.4 Home

Commuters identified sounds and experiences that evoke feelings related to home as being pleasant. Here, Eliade's symbolic pattern of "regression to the pre-natal state" or "separation from the family" is explicit. One describes the experience of commuting linked to a feeling of returning to the womb as the most pleasant experience:

It is very womb-like (*laughs*), you are always sending to the womb that's going back to your primal state (*laughs*) and you can all sort of switch off, it's like lots of human beings just going into a little pod, and they are all squishing together but just pretending there is nobody else there, nobody has any contact, you know, very rarely, and you can be with somebody's umbrella on to your leg and you just pretend it's not there, and you're only in your little pod and you've just got this noise that envelops you, as you travel along, you are just hanging all these little pods on a hook ... you arrive, unzip yourself when you are back in the real world. (LL)

A volunteer said that when the LU is warm, she feels the sound of the doors, "when they work properly" (SB), especially in winter, and the place it is like a temporary home. Another volunteer mentioned how she listens for people who speak her native language:

I try to listen to what they are saying and that reminds me of home, because I can imagine that I like listening to my language in an informal way, it's not necessarily that there's someone who wants to tell me something, but just in an informal way like a part of the landscape ... I still listen even if they are talking very softly, I tend to really try to make my best listening what's happening. (*laughs*) (MA)

Other volunteer mentioned as the most pleasant that when "the little lady says the next station 'Shepherd's Bush'" (DS), because it means he is arriving home. The announcement of Heathrow Airport makes another volunteer feel closer to home. There is one sound related to the routine of work, such as the hydraulic system of the doors, described as a kind of relief because it is like when a piece of very hard, routine work is at last finished.

2.1.2.2.3.5 Media

The space itself has been imagined and perceived through references seen and heard in the media: films, television, or the theatre. For instance, the screeching sound in Bank reminds one commuter of any horror film. A play seen about a prison and the excerpts of music (four or five seconds each between the scenes) reminded another of the sound of the track responding to the train that “is a kind of metal current flowing” (RS). The experience is compared with being in the middle of a television set. One of them remembered hearing the “supersonic sound” (LC) of speed that the train makes as in films.

Mysterious sounds such as the wind noises and “tickling and clacking” (TG) of which source cannot be identified reminds one volunteer of the Doctor Who series in 1990 and the episode when the Jetty, “a kind of awful animal took over the underground” (TG), coming through the smoke; he does not know if the sound really existed.

Two commuters recalled the terror film *American Werewolf in London* by Jim O’Rourke; in one case, it is to describe the silence in a terrifying scene when a young man is alone on the platform. In the other case it is recalled to explain the feeling in Caledonian Road Tube station at night, a deserted place.

2.1.2.2.3.6 Orientation

Guidance around the complexities of the Tube is one of the main functions of certain sounds. However, some of the commuters do not remember having heard *sound signals* or sounds considered as helpful, nor have they thought of the sounds in that way. One of them notices that the sounds of the LU are as if “imprinted in your brain” (EM). They are part of life; if some of the sounds were taken away this would be noticed. The necessary signals depend upon the context and could thus be very subjective. Informants mentioned visual aids as useful especially when they cannot understand the announcements; they can count the number of stops. One volunteer affirms that she does not need signals yet understands how they are very useful for blind people. In fact,

the accounts of the visually impaired volunteer differed from the rest of accounts because he is constantly seeking signals in order to compile his virtual map. He listens to “the ticket machines, the escalators, and the direction of people that are walking in ... the sound of footfalls sort of showing the way, the sounds of people speaking” (HH). If he does not know where he is going within the station, he hears people's comments that indicate, for example, this is the way to the Central Line. However, if he knows the way he listens to other things; it depends also on his mood. He prefers not to ask people: just to listen to them. In terms of orientation, he quoted the sound of escalator, or the sound of trains when they pass into the tunnels before reaching the platform, are useful.

Mostly, commuters have recalled signals that they have learned to identify as sounds closer to their destination or when a sound that they do not like is coming. Sounds that help in finding the way to the train or to the exit through the corridors such as announcements and beeps may be useful.

One volunteer mentioned the buskers as signals to the way out, by following the music. For another commuter, when she hears music she likes, she stops to listen; otherwise, she moves on.

The wind announces that the train is arriving and also warns those on the platform to be alert, on their guard. The sound of the huge amount of people tells one commuter to keep clear: they have learnt how to distinguish the sounds of gears, or where trains join the line. When the train stops and the signal to pull out cannot be given, the sound of another train passing means that our train is about to move on within a couple of minutes. The passengers wake up “automatically” with familiar sounds near home or when it goes above ground after a long journey underground. When the train reduces speed, it makes them think that something is happening.

The sound of the train changes when it comes from under ground to above ground; this itself constitutes a signal. For one commuter certain sounds indicate the time of day, such as loud sounds late on a Friday night; others during the working hours; at lunch-

time; the regular travelling of school children, and young people during the school holidays.

As a result of their routines, commuters create their own representation of sounds and other signals to navigate in that space that they really wish to understand as a free space. Some of these signals are shared, but most of them are, naturally, specific to their personal experiences. In the shared space they insist on keeping their individuality, which involves private spaces such as their body and the notion of home. The sound of the lines seems to be a shared space, as are some of the visual references of certain stations.

The foregoing has presented a detailed description of sounds heard by commuters in the LU, and the feelings produced by these sounds. The interviews have shown through a diversity of accounts how the listening process is experienced by commuters while they remember the commuting routine. At the beginning of the interview, the sound was described as weak in comparison with the image in terms of memory. However, when the researcher asked for details based on feelings that the sounds produce, the volunteers expressed very detailed memories of sounds. It seemed that volunteers tended to experience, within the routine, a *listening in readiness* and a *background listening*, terms coined by Truax and defined above. They identified meaningful sounds and the feelings that these sounds produce. The sound memories blend between spaces; there are more numerous sound memories related to particular lines than there are to stations. The experience was also described as timeless; the sound does not lead informants to identify a particular time, except Christmas. They recalled repetitive sounds, such as the sounds of machinery, imitating these with vocal sound effects; they also frequently imitated announcements.

The process of remembering shows a nostalgic feeling, expressing solitude, the need for individuality, and oppression by the space - and also a sense of freedom. There is the enjoyment, for some of them, of an "alien" space. Remembering during the interview awakened the commuters' awareness of the acoustic environment. The memories are certainly part of what Wertsch called *strong version* and *distributed version* of

collective memory (*see* Chapter 1, p.42). On the one hand, there is a strong version, represented in the common knowledge of lines, spaces and particular aspects in which the accounts are closely related to elements of the soundscape, such as sound marks, sound symbols and sound signals; on the other hand, there is a distributed version represented in specific experiences with sounds and in the manner in which commuters built their individual worlds. In this sense the perception of the Tube differs according to individual experiences of life.

There are key elements that at this point feed the artistic work: sound symbols, keynote sounds, the perceptions of space and of time, and the importance of the light and “décor” of the stations. With respect to interactive tools, the interviews revealed the voice as an element that encapsulates and expresses memory, and revealed the enjoyment of freedom (navigating) as opposed to the feeling of being controlled. Some individual activities, such as writing and reading while commuting, are important in the consideration of interactive tools. In the same manner it is important to acknowledge each commuter's need to create their own respective spaces within the public space. Rhythm is a key element, both of enjoyment and of the significance of one's feeling uninterrupted and undisrupted. Above all the experience with the soundscape has highlighted “feelings” as an important element of the listening process. The accounts demonstrate that the experience in the LU does not deal simply with noise, or with pleasant and unpleasant sounds. The sounds are evocative and produce intense feelings in the passengers. In the following phases of the fieldwork informants confirmed the importance during their journeys of some of the sounds mentioned, and discovered further fresh elements through which to describe their sonic experience.

2.1.3 Travelling - recording

In general the commuters were very keen on making the recordings for the second phase, and there were different expectations as regards the work. One commuter said she would be interested in “how consciously to re-listen to what’s going on [with the sounds in the Tube]” (LL). Others wanted to choose an interesting journey or a particular and important experience for their memory. Some commuters expressed the

desire to make music: “*musique concrète* type sounds” (JC), or to “combine natural and electrical sound and to record it might be interesting for her” (YN); otherwise, “developing music with the snippets of conversations” (DS). A further interest was improving English, and discovering which vocabulary is used in the underground. Another volunteer said that this research has aroused questions that he had not previously thought of and he wanted to help.

For the research, the purpose of this phase was to register commuters’ personal perceptions of the soundscape. It was important to register the journey naturally, taking into account the spontaneous routine of commuter. Commuters were asked to select a journey from their routine, rather than individual sounds. An invitation was issued to them before starting the journey, emphasising its character:

London, 29/09/04

Dear Commuter,

We will record not just sounds of the London Underground but your commuting experience; this is the most important issue for the research.

Please feel free to express your feelings towards the sound, memories and anything you consider is part of your commuting experience. Also, feel free to be silent, to listen to the soundscape or follow your common activity (what you like to do) when you are commuting. This time I am not going to ask you anything. I am accompanying you.

Thanks so much for your time, and have a very good day!

Ximena

During their journeys, the commuters introduced the researcher into the London Underground’s space as if they were guides in a strange space that truly belonged to them. They knew where to go, what to show; the researcher became a “guest” on their journey. The knowledge of the commuters about each single space in their journey was vast: they decided which routes to take and which ones to avoid. They keep their own rhythms, depending on the purpose of the journey. Some of them were silent and followed, in fact, their routine (looking at their diary, preparing a meeting, or listening to music through their headphones). Others pointed out situations or sounds they had mentioned in the interview, in a sort of proof of their memories; these memories were now clearer and more selective. Other passengers looked at the microphone and

participated in the recording while “joking”, or avoiding being recorded. The soundmaking took the form of conversations initiated by volunteers. They were talking to the researcher about sounds that are usually there, but “today” were not there; volunteers also talked about behaviour, feelings, memories or asking about the research, whether the minidisk recorder was working well, and so on.

In the journeys they had a heightened sensitivity towards listening: volunteers were aware of sounds that usually are in the background, and pointed out sound signals, keynotes, and meaningful sounds for their routine. This time they experienced Truax’s *listening in search* (see Chapter 1, p.28). They were talking about their experience, what they thought of people’s behaviour, and about their own behaviour on the Tube. “I don’t like to run, everybody runs” (NM); “Today I feel grumpy” (NM), and “People don’t speak on the platform. The only sound that we can hear is the sound of the trains” (LC), they said.

At the end of the journey the researcher received comments about the recording experience: “nothing particular”, “it was fine”, “the same, boring”, “a bit different today”, “not many people”, “at least you have your recordings”, “it reminded me of the sea”, “that scene was weird”, “what we are doing is weird”, amongst others. For two volunteers, the experience of recording was related to reviving memories. They are commuters who have stopped commuting yet nevertheless wanted to participate in the research. The experience for them was full of nostalgia and commenting on things that no longer exist. It was particularly noticeable that they wanted to extend their journeys. They made the researcher follow them out of the Tube, to see the house where one woman used to live, even to knock on the door, and, in another instance, to go to the bus stop where this man used to cross to go to school. The rest of the commuters found it strange that we finished the journey in the street, and wanted to complete the recording before leaving the Tube. It was a reminder of the existence of more constraints of time and space when the journey is a routine, or when not considering all the space of the Tube as an important part of the activity.

The technical equipment used was a minidisk and Beyer stereo microphone. After the recording the researcher took digital photographs of the entrances, exits, walls and furniture in detail, and general views of the lines and stations visited with the commuters. The researcher also made MS recordings⁶⁵ of the different spaces of a station, namely platforms (closed and open air), escalators, ticket area, and entrance-corridors. In total, twenty-one journeys were recorded between 2004 and 2005, on almost all of the lines of the LU, and with an average duration of thirty minutes: the shortest being 10'53" and the longest 59'19". The recordings covered all days of the week in order to compile a representation of different routines. (See Appendix 4)

2.1.3.1 Listening

Three months after recording, nineteen volunteers listened to the recordings of their journeys, with headphones, in a quiet room. Each was asked to select meaningful sounds, to name them and to say why they were meaningful, while the researcher was transcribing the information. The researcher registered the name of the sound, the line and/or station where it was recorded, and the reason why the sound was meaningful. The largest number of sounds selected by a volunteer was thirty-nine, and the lowest number was four. Only two of them found difficulties in selecting sounds that really attracted them, although they selected five sounds from their journeys. At the end, they were asked five questions (see Appendix 5) to summarise their feelings of this experience.

In this last phase commuters experienced a more *reflective* and *contextual* listening. (See Chapter 1, p.28) Their comments were closely associated with themselves and with their own mental world of sounds, such as music or places different from the LU. It is probable that when listening to their journeys through the headphones, commuters became more conscious of the sounds because of the factor of "integrity" with themselves, as suggested by Schafer (see above). At the same time, they were closer to other volunteers' accounts identifying symbolic meaning in the sounds.

⁶⁵ Recordings made with a stereo pair of KM 184 small diaphragm cardioid condenser microphones, and a Digital Audio Tape (DAT) recorder.

Most of the volunteers, when listening to the recordings, identified each sound with its source; the sound was familiar for them. It also reminded them of places such as on a train in Peru, and the city Kyoto; of singers such as Björk, and of the drums of UK Fat Cat, (specifically the CD *Miles of Smiles!* Black Dice 023 “Trip Dude Delay”); of objects such as birdcages. It seems in the recordings that the Tube is a “secretive world” where people make an “effort to talk” (SB), and the rattle of train is hypnotic. One volunteer identified various timbres. For some of them it was difficult to identify meaningful sounds.

When asked about their respective routines, as based on the recordings, some of them described it as being as boring “as my life”, ordinary, uneventful, hectic, not exciting, not pleasurable, a work routine, oppressive, monotonous, something that has to be done, and stressful, while others thought it was an easy journey. Some volunteers took it more personally, looking at their role in the recording and expressing that they saw themselves as contributors towards keeping people safe, or as experiencing an internal journey. In this case the process that commuters experienced is similar to the process employed by the composers Truax and Norman when working with real world sounds or soundscapes, i.e. “personal experiences entering their own inner mind worlds” (*see* Chapter 1, p.35).

The perception about the recorded journey varied: sometimes it seemed noisy and sometimes quieter; sometimes it was terrible, and at other times it was surprising; sometimes tiring, and at others calm. It was perceived as louder than reality. Other volunteers described it as a nice sound, distinctive and different when recording. They were more aware of interesting conversations, of how “offensive” certain sounds were, or of how “noisy” the journey was. They talked about themselves, during the recording: laughing at their voices or admiring them, criticising their own comments, or making the same comment they had made in the recording, a few seconds before they heard it. This happened with almost all of them and it was surprising to them and to the researcher. Some of them were nostalgic, saying that this version was more emotional; they talked about a journey in time, where there is no defined space.

Volunteers named the sounds based on the source, such as “doors open”, or on the image that the sound created in their minds, such as “tribal bees” or “storm” (see Appendix 6). This can be compared to the interpretation of the sound environment made by soundscape and real-world-music composers, and to the selection of meaningful material, insofar as they incorporate their own memories and imaginations, making associations with the “un-reality available in real life” (see Norman Chapter 1, p.35).

Volunteers discovered sounds that were new to them namely, the street, the idea of peace, and the silence on the platform; prison; electricity, people; snippets of conversations – Americans; air pressure – doors, footsteps, conversations, squeaking escalators; small sounds, the Doppler effect; some were missing sounds that they could not find in the recordings, such as those of the escalators. One realised how women speak with higher pitch, and that there was not a noticeable presence of men. Their discovery increased their associations with images stimulated by those sounds. Some associations involved the body, such as a “rush of blood – veins”: a similar metaphor to one other commuters have made in the first interview. Some suggested nature (e.g., sounds resembling a “storm”), and yet others suggested an artificial environment, such as the image of a dry place where there is no water and no heat.

On the other hand, the researcher asked if the sound created images in their minds. For some of them it did not do so. For others it created images of machinery, rhythms, percussion, speed, a plane, horses, light-speed, prisons, landing, spacecraft, waterfalls, stones, a party, a multitude, silence-solitude, metallic sounds, routine, steps, instruments (e.g., *zampoña*, or Pan pipes), visual cycles, natural images, storm, people in the background, space, cold, warmth, earth, water, and fire. It also brought images of a science fiction film and of “*Les Amants du Pont-Neuf*” by Leos Carax, which is nostalgic - because of the train, although this is not the case with the Tube: “this is not romantic” (YN). The sounds brought the image of almost being on the train, awake and asleep. One volunteer said that he needed to build an image from the sounds. The recording “is just 90 per cent fidelity” (HH), one of them said, as compared with the

real sound. They also mentioned how stimulating the sound was. There is an image of timelessness, and another of modernity.

Volunteers drew parallels between sounds and materials, such as the textures of creased fabric. Most of them mentioned the sound of metal: the metal of brakes and tracks, the metal of a prison, or the metal of a spur (of a horse). They described materials found or related in the sounds, such as (in decreasing order according to the number of commuters who mentioned each) stone; water; primal waterfalls; plastic; air; slippery surfaces; leather shoes; paint; veins; storm; violin; brass; bees; tribal sounds; paper; newspaper/reading; a tap-dance table; wood-hard; heat; shoes; the way people walk (sexy), and people coughing. These observations are linked with Thompson's study of listening individuals' relationship with the architectural spaces and the materials of which these were built (*see* Introduction, p.21).

The idea of working with textures, both in sounds and in images, in the structuring of the interface was now confirmed. Given the selected sounds, the acoustic differences between spaces were clearer, and the researcher had finally compiled the whole material needed to articulate the artistic work. The presence of sounds selected repeatedly led to the creation of sub-spaces, i.e., particular groups of sounds circumscribed within the main spaces into which the interface was divided. As listening to the whole journey provoked fatigue similar to that of the physical experience, particularly on long journeys, it was important to devise interactive tools where the user can control the movement between spaces.

When selecting the sounds, commuters were in, as it were, a "third space" between the real soundscape and the recorded soundscape, one based on listening, remembering and soundmaking (with their voices). The researcher wanted to make the speakers aware of this new "space"; in her meeting with the last volunteer, she refrained from prompting or asking questions during the recording of the commuter's journey when the commuter was listening to and selecting the sounds. In this event the commuter's reactions flowed more spontaneously. This case allowed the researcher to think in terms of narrative; the

experience with a recording of this last interaction is described below (*see* Artistic work, p.112).

According to these accounts, volunteers share characteristics that go beyond the identification of the sounds: first, they experience a moment with themselves, imagining and perceiving the recordings as part of their own mental world of sounds, and second, they share metaphors, images, associations, and sensations that relate to other sources and can be familiar for other commuters. Thus, the sonic experience can be understood as individual and at the same time *collective*, or culturally meaningful.

To summarise: the fieldwork provided a huge variety of elements through which to consider the experience of commuting and its representation in a virtual space. It was possible to notice the differences between perceiving the Tube through memories, through the living experience and through a recording of their journey. All of the accounts gave an image of what space is already built in commuters' memories and elements that are part of it, including an image of where some of these memories meet while others that are still without connection. The clear link is reflected in their knowledge of the space and their movements based on their activity of commuting.

The relation that commuters established with the soundscape was strongly related to the voice. In fact, it comprised feedback to the soundscape, which was reflected in different ways: in the imitation that they made of the sounds of machinery and also of people's sounds, particularly the repetitive utterances in announcements; in the importance that they gave in their accounts to the conversations and how these are interrupted in the carriage through its loud sound; in the selection of their own voices and other people's voices, and also in their selection of announcements.

Metaphors to describe the Tube were related to the human body, veins, rushing, and also the rushing of water. The train is related to the body and the perception of the body in this space, thus the train has been perceived as an extension of the body. It suggests

that the interactive environment could be understood as highlighting the humanity that exists within this space yet is obscured by some of the conditions of the space.

On the other hand, the accounts showed how the LU's soundscape is a reminder of different times in the history of the urban soundscape; sounds of machinery are still more powerful than are human sounds, particularly in the carriage, the place where commuters spend a greater proportion of time during their journeys. The sounds interrupt conversations or impede the starting of one, just as they did during previous eras mentioned previously within the story of London's Soundscape (*see* Chapter 1, p.25). Hearing natural sounds in artificial spaces in the stations was mentioned, as were accounts describing the sense that the most pleasant sounds heard in the LU are related to nature.

The criteria from which commuters chose the sounds were based on feelings, associations, and memories that those sounds brought back, rather than on the level of decibels - although they were completely aware of the sounds that they do not like. During the three phases of the fieldwork, most of the commuters were experiencing different modes of listening, increasing their awareness of sounds. From *background listening* and *listening in readiness*, they experienced in the last phase *contextual* and *reflective listening*. All of these processes of listening and remembering have provided key elements to the creation of the interface and the navigation.

The artistic project takes as a main source the sounds chosen by commuters and reflects onto these the interviews, in order to extract the most meaningful elements needed for the creation of the interface. They form the basis on which to create the structure of a virtual space. The interactivity is thought to maintain the individual experience of the journey, while emphasising the elements of a shared space.

2.2 Artistic Work

During the development of the fieldwork the researcher developed a series of sound files, understood as an artist's sketch of the desired final result. The first sound file (*see*

Appendix 7) is a result of the personal journal and an attempt at understanding sounds in the space, gestures and textures. The second sound file (*see* Appendix 8) is the result of the first phase of the fieldwork where interviews were recorded. This is a mixture of accounts describing the actions and feelings of commuters in different spaces in the underground, taking into account the narrative of the journey: going down to the train and going up to the surface. The third sound file (*see* Appendix 9) was created from the third phase of the fieldwork. At the same time that one volunteer is listening to the recording of her journey, she is commenting on the experience. This experience is recorded. The researcher took this file and mixed the files that the volunteer selected. The result is a file where the volunteer “is talking to herself”; in the sound two spaces are distinguished, the public and the private ones. In this file, the researcher argues, it is possible to think of the existence of a third space that combines this re-experiencing experience. The informant's voice was recorded with a low quality microphone (used by PC users) to resemble the particular sound that could be produced by voice recorders through the web⁶⁶.

Once the material of the fieldwork was completed, the researcher was able to define the interactive environment. The Interactive Sonic Environment could be defined as a mechanism that takes fragments of sounds, images and texts in a multimedia structure following the narrative of a Tube journey. The Internet has been chosen as the medium for playing with this multimedia interface among triggering sounds and images, for receiving the feedback from the user, and for the addition of sound and images to the interface.

The interface has been created based on memories that commuters have expressed during the three phases of the fieldwork. In the interface, the focus has been on: the type of sounds remembered; the perception of individual and public space (based on activities and interaction of each commuter with the space); the perception of time, and the sounds selected from the recordings. The process of creation is thus described, taking into account interface, interactivity and sounds.

⁶⁶ At that time, the author had not knowledge of software such as Skype using P2P technology, that allows higher quality in the transmission of voice through the Internet. In the third Chapter, this new technology is mentioned as a possible future application for this project.

2.2.1 Interface

Firstly the researcher attempted to structure the interface classifying memories by means of association. This option was highly complex because "associations" could lead to a narrow, prefabricated conclusions about what the experience meant, thus halting the process of transforming memories. Second, the researcher considered structuring the interface solely according to the sound types noted above, since some of the selected sounds clearly suggest this kind of organisation. However, this option proved problematic because there were a large number of sounds that were unique, too subtly diverse for straightforward categorisation, or too subjectively described by the commuters. In the end, she decided to follow the narrative offered by a Tube journey, which follows the spaces through which the commuter moves in completing the journey. The purpose here was to make of the original space (the LU) a single, representative space offering unique combinations of multiple sounds.

2.2.1.1 Space

The interface was divided vertically into five spaces: 1. entrance/exit, 2. tickets, 3. escalators and stairs, 4. platform, and 5. carriage, representing generic places, part of any London Underground journey. Each space was divided into categories, reflecting two aspects of the soundscape: firstly, the location of the sounds in the space, following the movements that commuters tend to experience when travelling and, secondly, the characteristics of the sounds (*see* Table 1). As regards categories, even if the "associations" were excluded, it was decided to include "nature" as a category belonging to the first and the fifth positions. This because it was considered significant that commuters heard sounds of nature, real or imagined, in such an artificial space.

First, all the spaces and categories were visible on a large screen (1000 x 2000).⁶⁷ This design made the navigation difficult, slowed the performance of images and sounds, and

⁶⁷ Measure in pixels.

TABLE 1. Spaces, Categories and Sub-spaces

SPACES	1. ENTRANCE / CORRIDOR / EXIT	2. TICKET AREA	3. ESCALATORS / STAIRS / INTERNAL CORRIDORS	4. PLATFORM	5. CARRIAGE
Categories per location, following commuters' movement and Categories per characteristic of sound	GD 1a. Entrance – street (4) 1b. Entrance – corridor (11) 1c. Entrance – nature (4) GU 1e. Exit – corridor (6) 1f. Exit – street (12)	GD 2a. Gates (6) 2b. Ticket Machines (3) 2c. Turnstiles (3) 2d. Oyster machine GU 2e. Other sounds (1) 2g. Gates (6)	GD 3a. Stairs, corridors, (6) 3b. Escalators, lifts, (6) 3c. Voices (3) GU 3e. Stairs, Corridors (9) 3f. Escalators, Lifts (3)	GD 4a. Just platform (5) 4b. Comments waiting (8) 4c. Train arriving (19) GU 4e. Between carriage-platform (3) 4f. Train leaving (3) 4g. Going to corridor (3)	5a. Decelerate (11) 5b. Accelerate (16) 5c. Rails: percussion (45) 5d. High pitch (14) 5e. Tunnel (9) 5f. Constant (12) 5g. Doors (31) 5h. Train stops (12) 5j. Nature (2)
Sub-spaces	Announcements (2) Steps (3)		Announcements (3) Steps (4)	Announcements (6) Steps (3) Trains (19)	Announcements (5) Doors (31)

Key:

GD = Going Down, GU = Going Up

() = Number of sounds per category

confused the purpose of the interface: to navigate and “wander” through sound. Then, the researcher decided to overlap all of the categories and spaces in a single space, making navigation clearer. On this final screen (1000 x 390), through a menu, the user can navigate between spaces looking at all of the available categories in each space. Furthermore, this screen was designed bearing in mind future tools, such as uploading sounds and images that can be attached to the interface yet working separately from the main environment.

Certain categories contained a large number of sounds, which meant that these were powerful enough, in the memories of the commuters, to create a particular subspace. Consequently, in the interface there are four sub-spaces: steps, trains arriving, announcements, and doors. The sub-spaces are present in more than one main space. It is possible to access them through the categories found in the main spaces (*see* Table 1). Notice that the only space not to share elements with the other spaces is the ticket area. The researcher believes that this is because the time spent by the volunteers in this space was very short. Also, the sharp sound of the gates stimulates the notion of this space as a particular sonic space, possibly in itself a sub-space.

2.2.1.2 Image

These sound categories or interaction points should have an image that represents them. In the interface they are represented by squares or rectangles that function as “windows”, towards approaching the journey experience. The number of images was given by the categorisation previously indicated. On the right, there is a rectangle divided into five smaller rectangles in dark colours (fig. 1). Each represents one of the spaces that constitute the journey experience. In each space, the images selected were derived from documentary photos taken after each journey. They are abstract images, showing textures from furniture and architecture from the LU, placing emphasis on the materials that are reflecting the sound: shoes, floor, metal handles, tickets, walls, stairs, escalators, lights, trains, speakers, seats, windows, floors and personal objects from the volunteers. These abstract images help the listener to focus on the sounds rather than looking for a meaning between sound and image. They also represent the materials that

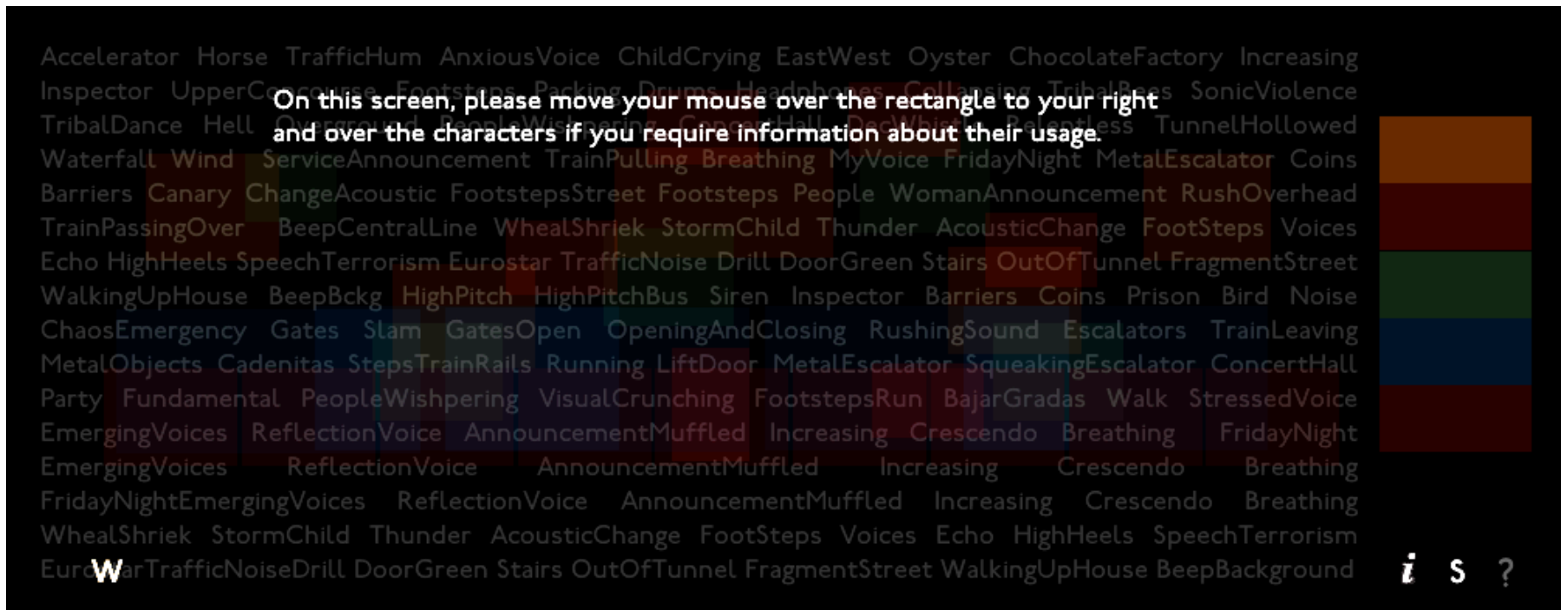


FIGURE 1. Navigation menu

commuters said were related to a sound, without recreating the entire object that produced it. However, some of the spaces and the sub-spaces have a concrete image indicating the source of the sound. The distribution of the images is symmetrical, distinguishing the downward and upward movements as well as the structure of each space (fig 2-10). In the background the presence of text is slightly noticeable. These words are the names given by the volunteers to the sounds they chose, and are considered an important part of their memories. On the web site (fig. 11-15) the feedback that the user gives, when playing with the shockwave application, creates a cloud of keywords (in a section called “Listening and Remembering”), which are entries from listeners’ responses to the sounds. Over the black background there is coloured transparent layer per each space.

Graphic elements such as coloured lines and characters provide extra information. The coloured lines give information about which line the sound was taken from. (It is important to note the importance that lines have for commuters, and how they are able to identify the sounds of particular lines (*see* Chapter 2, Lines)). In the fifth space this information is not given because three sounds are playing simultaneously when an image (category) is triggered. The characters **W**, **S**, **i**, and **?** give information about the functions of Writing, Silence, information, and Guidance (instructions on the first screen of the shockwave application). On the CD-Rom version there are two additional letters: **Q** to go back to the initial menu, and **R** to read on the Internet an updated version of memories and of the application.

Cursors are important in the navigation. There is the Tube symbol, used as a cursor that indicates the option of changing spaces by clicking on the required image. The other cursors are: a cross indicating the triggering of sound and the change of image (each time the user mouse over the images), and a hand indicating the functions mentioned above.

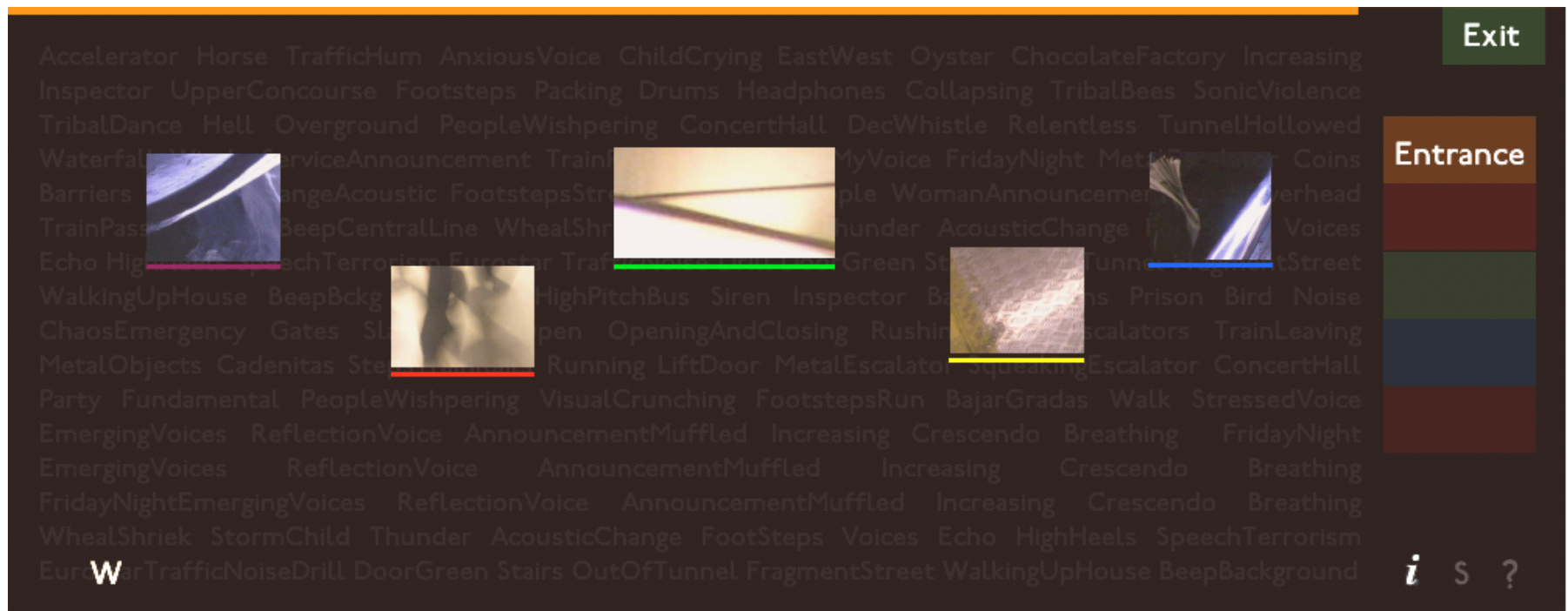


FIGURE 2. Entrance - Exit



FIGURE 3. Ticket Area



FIGURE 4. Corridors - Escalators

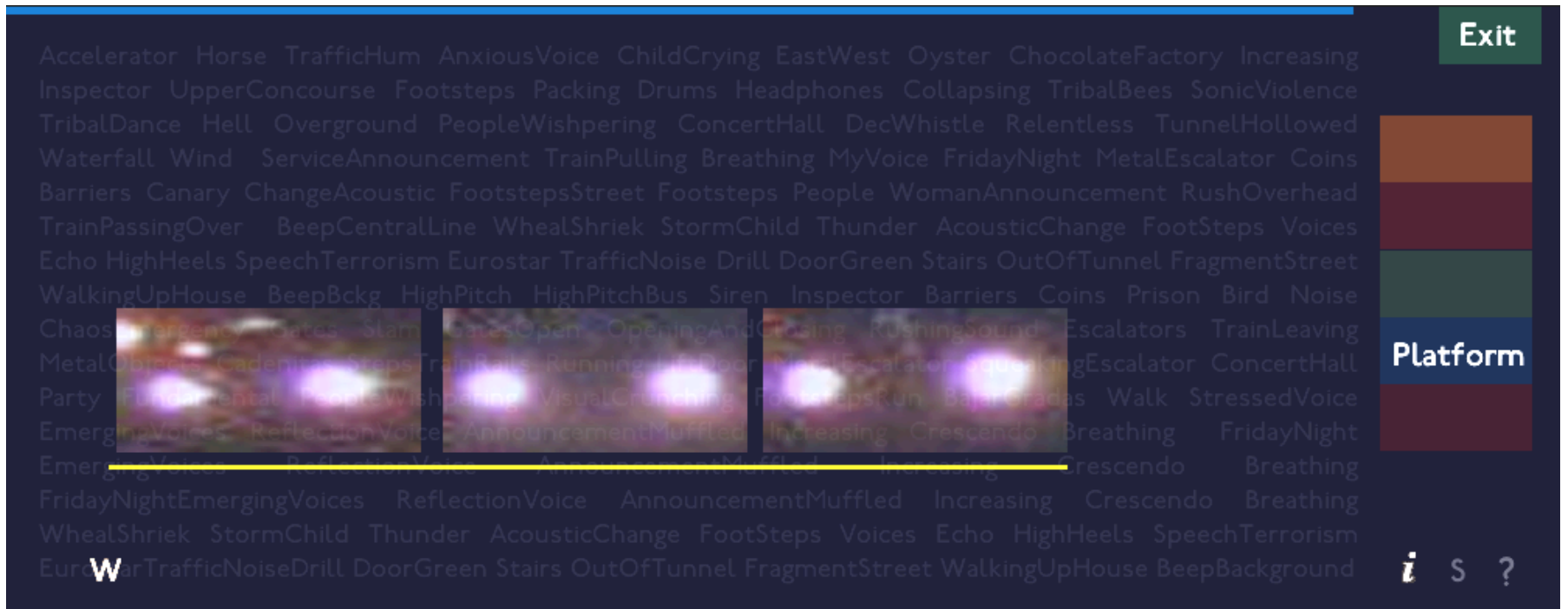


FIGURE 5A. Platform going down

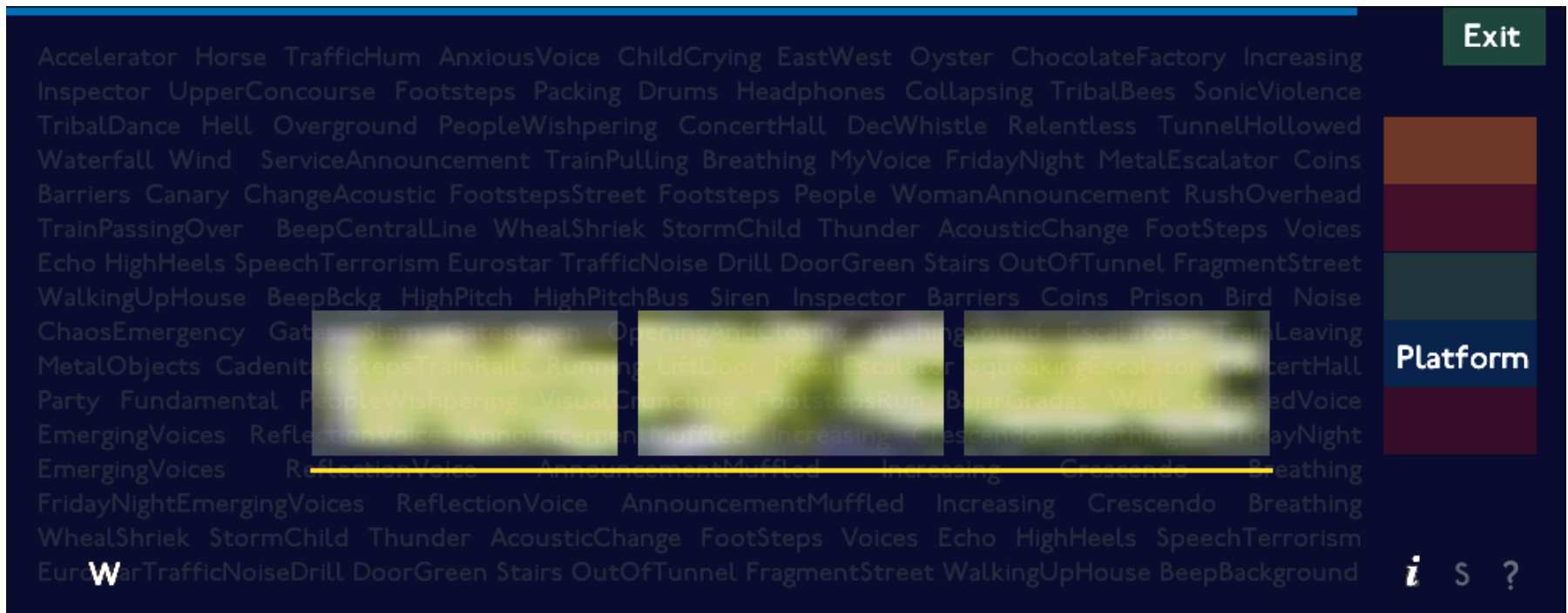


FIGURE 5B. Platform going up

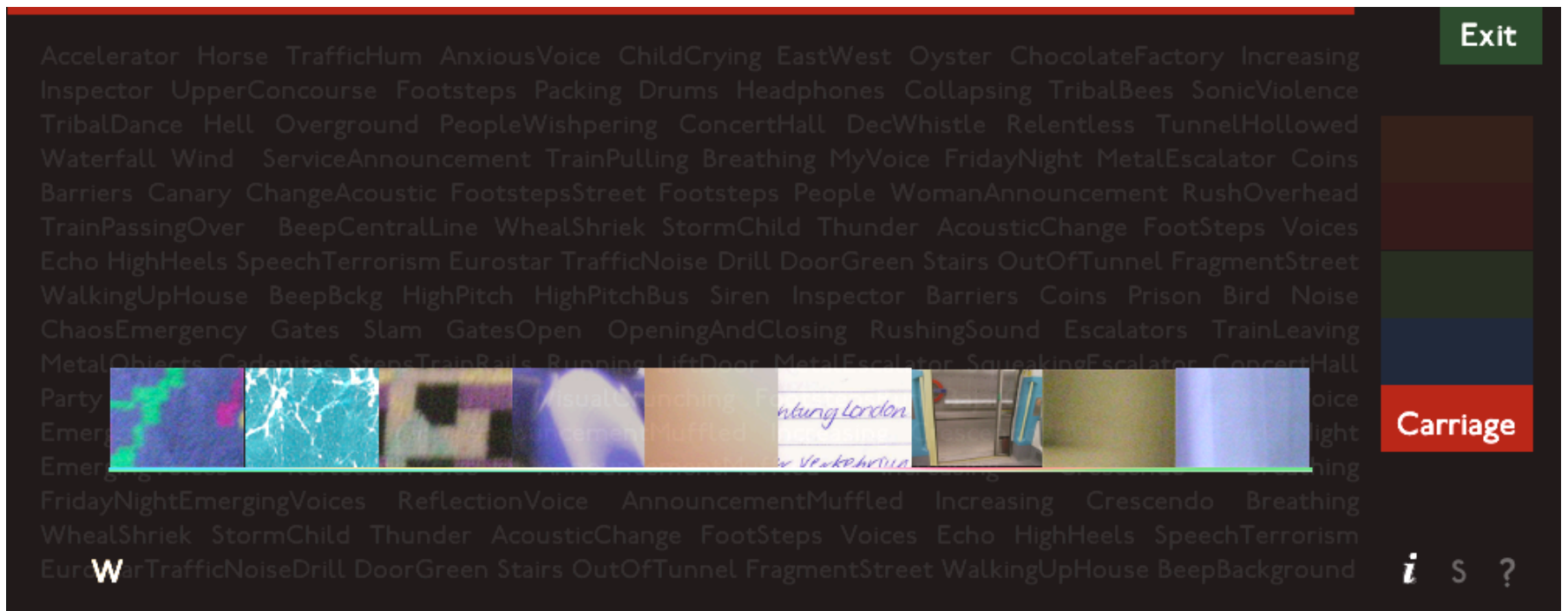


FIGURE 6. Carriage

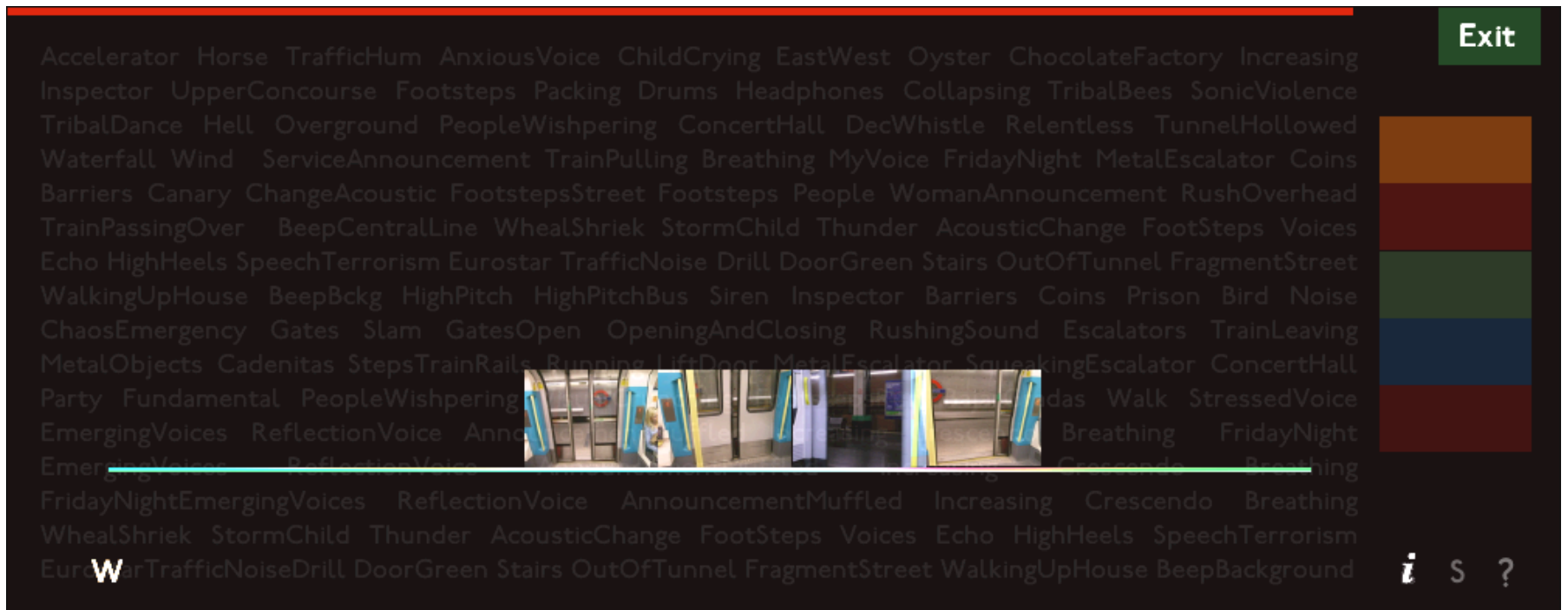


FIGURE 7. Sub-space Doors

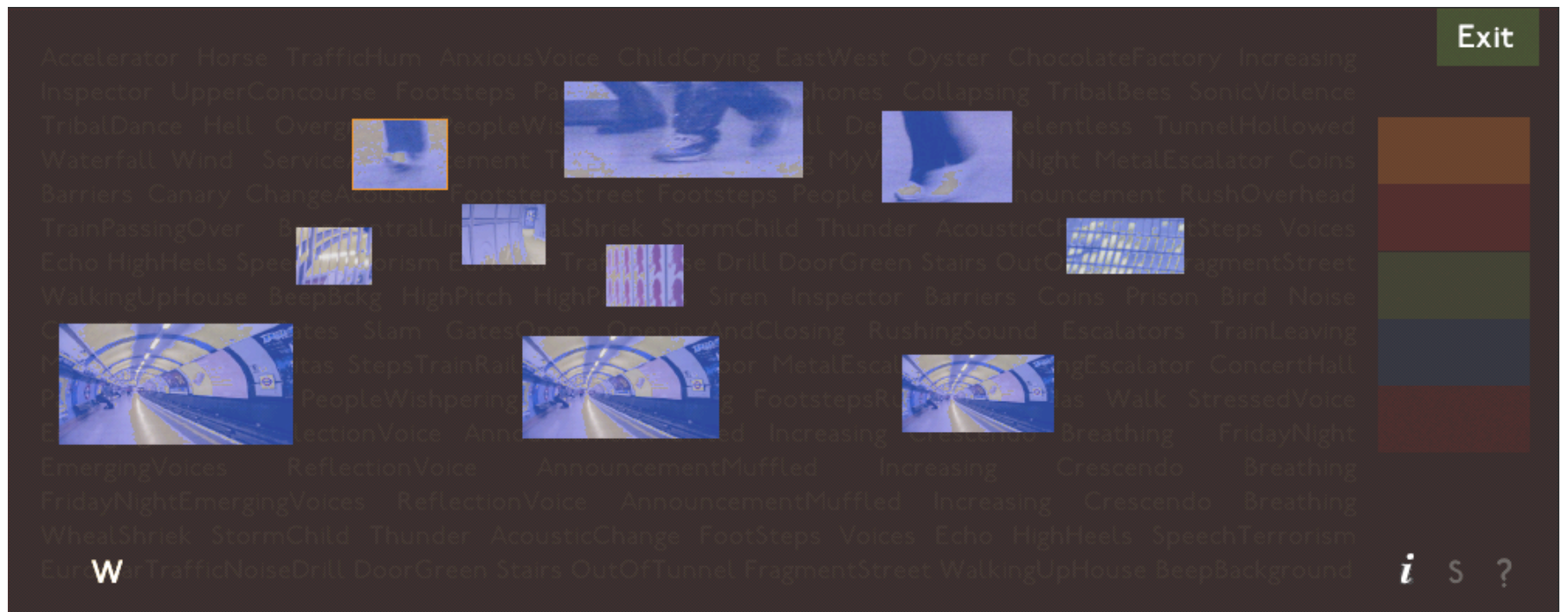


FIGURE 9. Sub-space Steps



FIGURE 10. Sub-space Trains

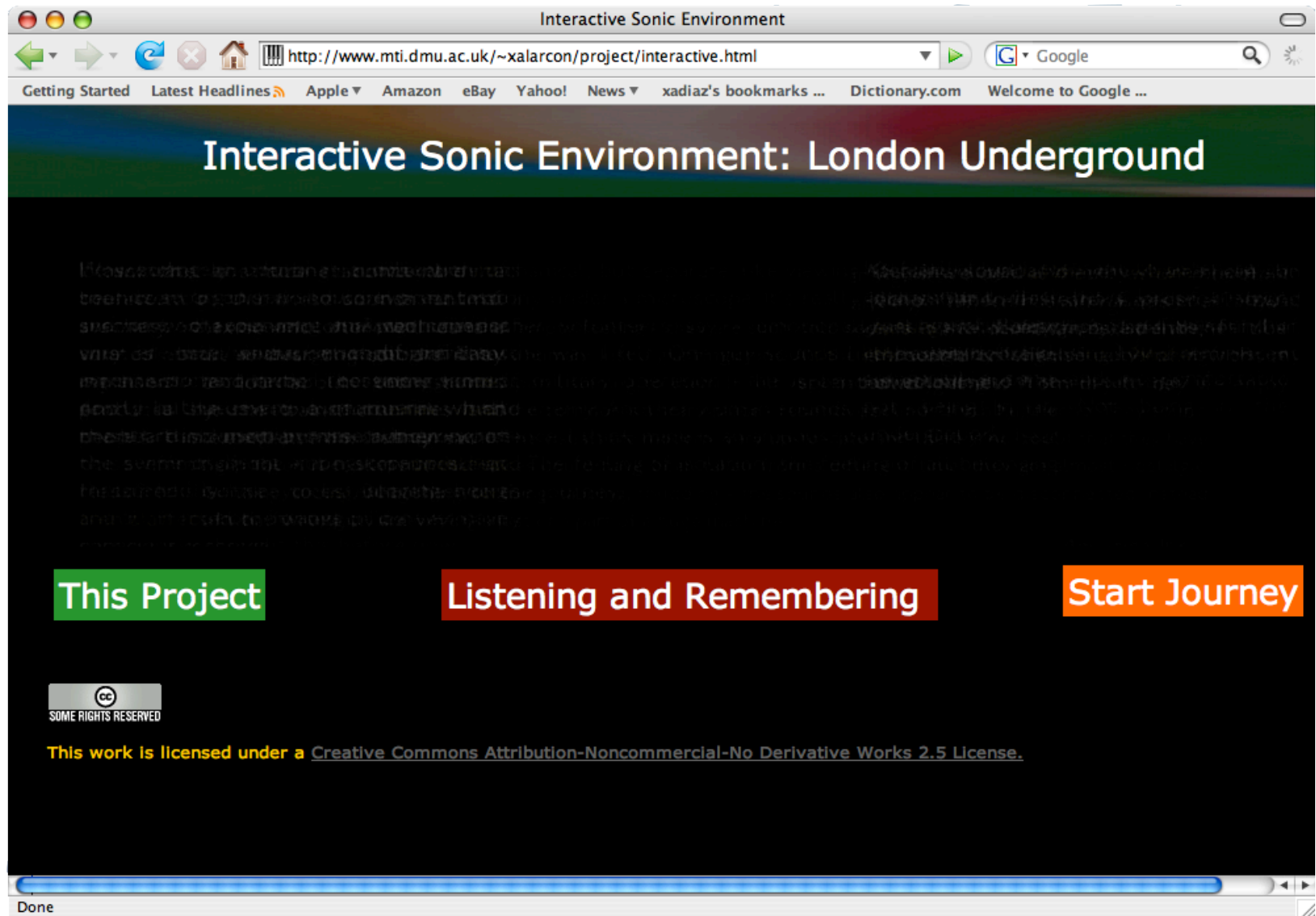


FIGURE 11. Main Menu Web Site

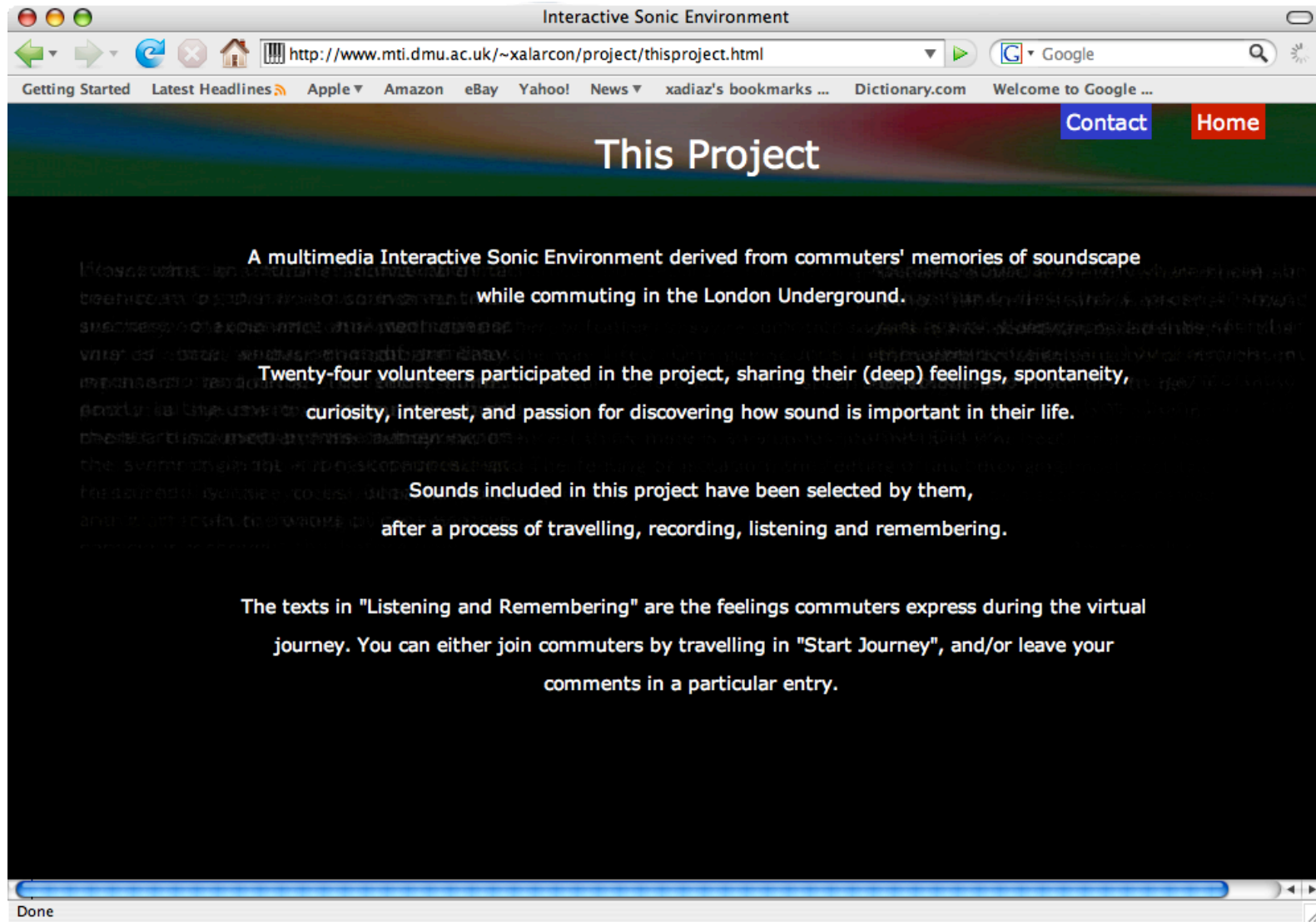


FIGURE 12. This Project

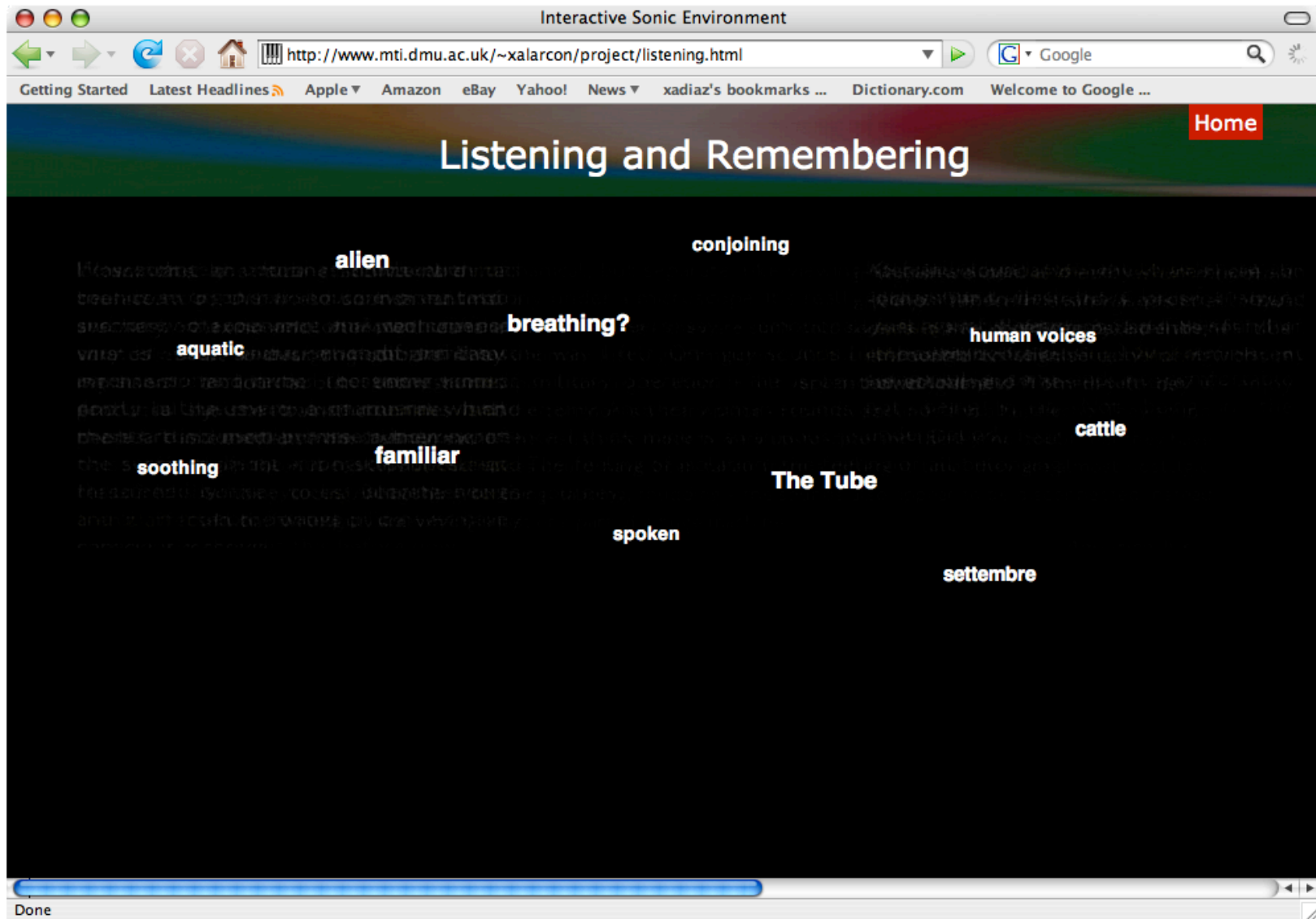


FIGURE 13. Listening and Remembering

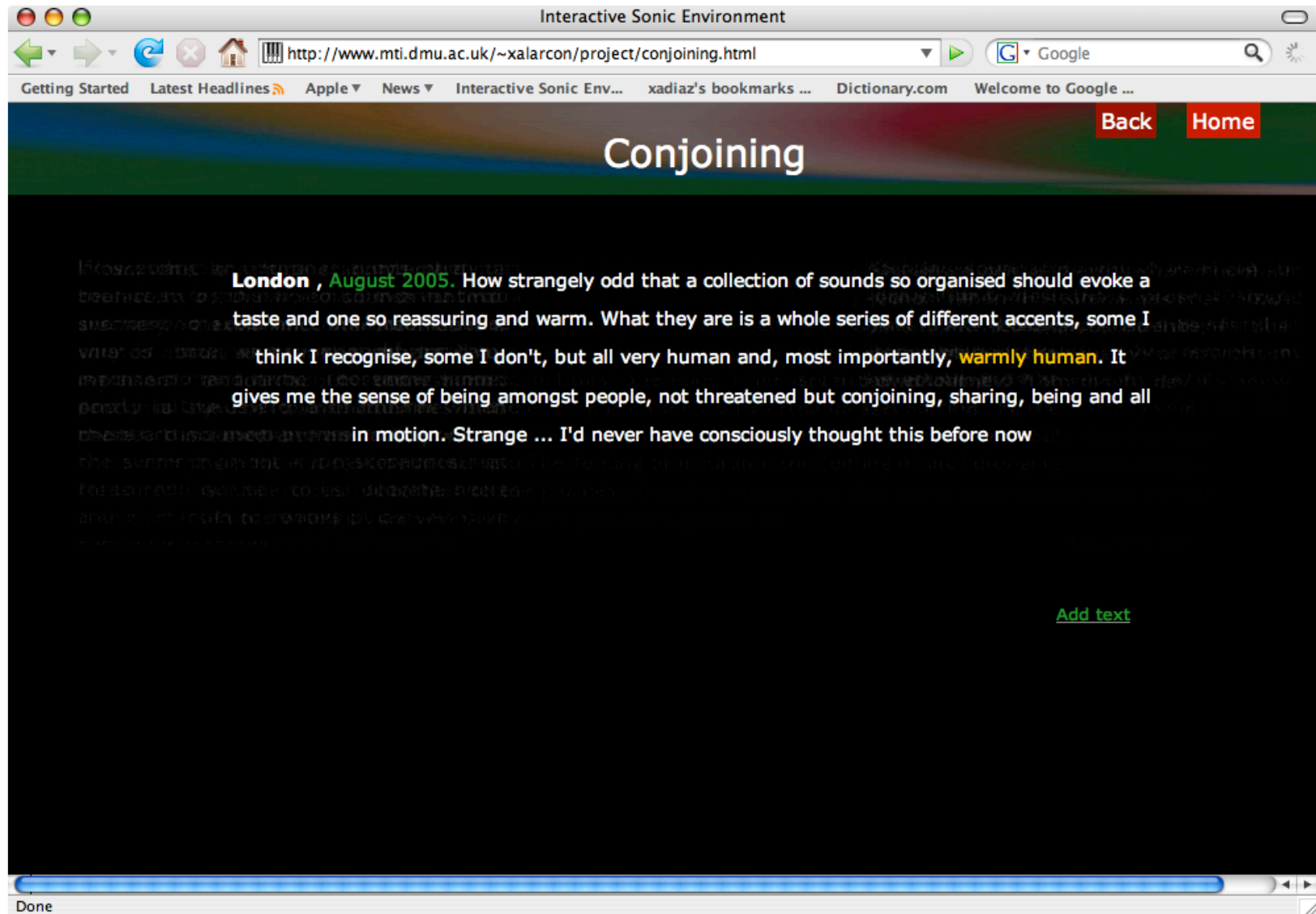


FIGURE 14. Keyword – writing

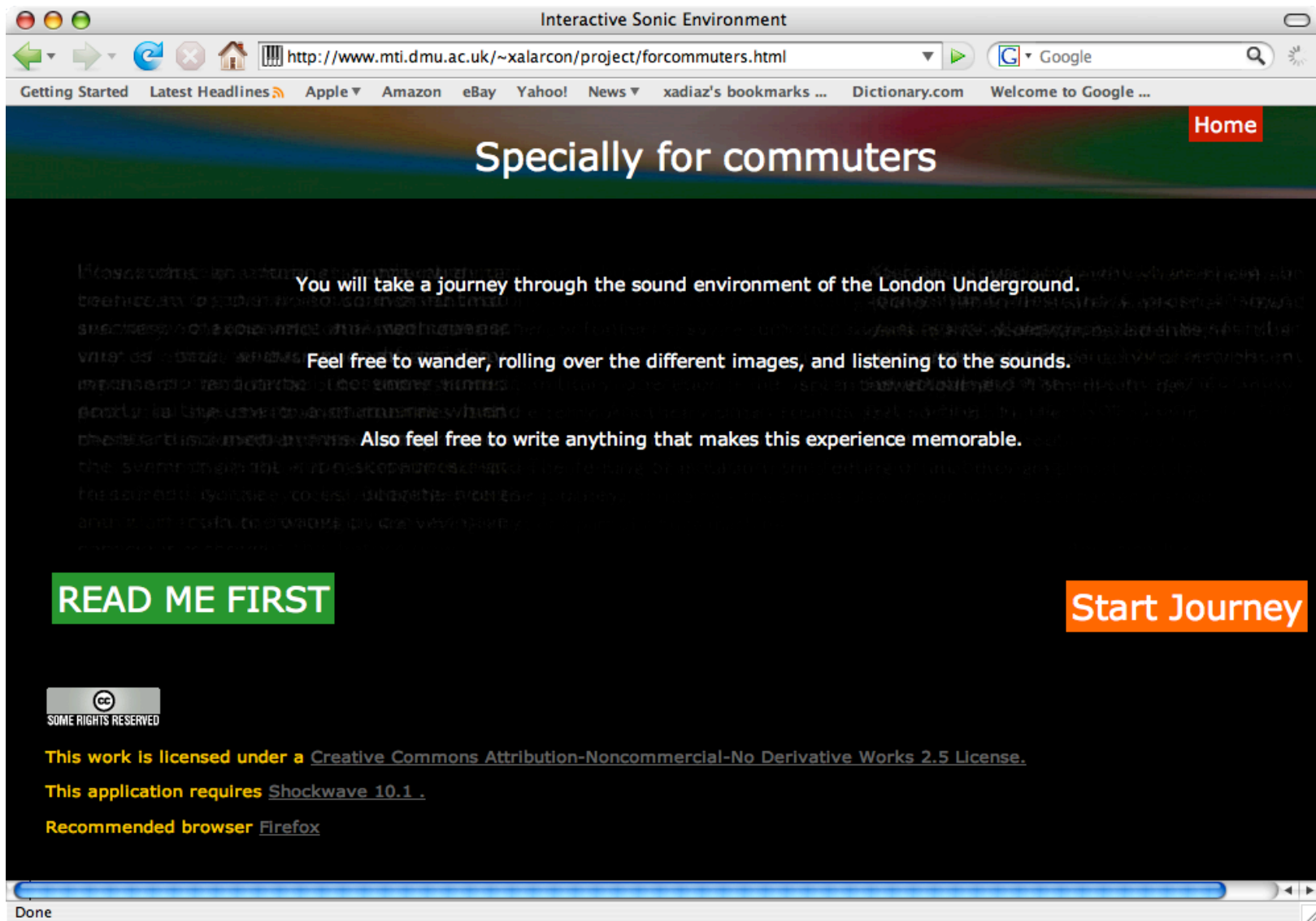


FIGURE 15. Start Journey

2.2.1.3 Sounds

The sounds used in the interface were: sounds chosen by commuters in the third phase of the fieldwork, and “keynotes sounds” taken from the MS recordings made by the researcher (*see* above). In order to provoke sensitive listening to the whole environment, the researcher used a layering technique. Layering is created by the presence of a maximum of eight different sounds playing together, for which the fades in and out have been controlled according to the position of the images on the screen. To trigger sounds the user must either roll the cursor over an image, or click on it. The access to sub-spaces is indicated with an empty rectangle. The rest of the images trigger sounds and change images with a click. From space one (entrance and exit) to space four (platform), each rectangle triggers one different sound for each time the user clicks. In space five (carriage) each square triggers three sounds simultaneously. It creates a sound texture in a different manner to the responses to other spaces: in the carriage, the interface follows the movements of the train, and the passenger is sitting in the same place. The first idea of mixing three simultaneous sounds was to have them at different and fluctuating audio levels. However, the results were not dissimilar to the option of having the triggered sounds at the same audio level. As each category triggers three sounds in the carriage, the user is usually listening to six sounds playing simultaneously. The sub-spaces are sonically powerful, since sounds with the same characteristics are playing together, as occurs sometimes in the real underground.

As regards the interviews, understood as oral memory, these took place in a different space, not in the LU, as occurred in the first stage of the fieldwork. The researcher decided not to include them in this interface because the tone of these interviews is nostalgic, and suggests distance from the environment. Comments taken from the journeys contain instead more expressive features (spontaneous reactions) that are mixed with the soundscape and are already a response to the environment (*see* Truax Chapter 1, p.22). For those reasons, the researcher, who was more interested in the transformation of memories rather than in their preservation, did not include sounds of this type.

The Interactive Environment offers the options of both listening and expressing memories. The experience of the journey is reflected in the structure, and the sub-spaces and categories have been designed according to the accounts of where the memories meet. It has taken into account elements of time, space, and memory. In terms of time, the memories were not organised chronologically. As noted above (*see* Perception of time, p.93), commuters described commuting as a timeless experience. Seventeen of the recordings were made in the same week in September 2004. One recording was made in December 2004, and the final one in January 2005. It may be possible to notice differences in the soundscape if new recordings from, for instance, 2006, were made. Some stations have been refurbished, and the system of the Oyster Cards is more popular among commuters. Ticket machines and some trains are also new on certain lines and in certain stations. The announcements will reflect a greater number of announcements for passengers; new voices will be noticed. The experience with space as the first element reflects the real space as an accumulation of the multiple spaces that follow the same pattern: entrance-exit, tickets, corridors, platform, and carriage. Furthermore, it reflects the idea of tracking the individual space through the expression of memories given as text in the virtual space.

2.2.2 Interactivity

The aim of interaction is to offer a flexible structure for horizontal and vertical navigation, allowing the users to sense a non-linear journey while maintaining their original experience. The invitation to the user is towards the discovery of the soundscape through different spaces and categories. The interface invites the user to combine the fragments that compose the soundscape, and to create their own narrative and experience of the journey. Freedom was considered an important feature in the navigation, given commuters' feelings regarding sensation in the space (*see* Chapter 2, Body). Thus, the interface provides freedom of movement between spaces. As regards navigation the researcher has taken into account: distinctions among types and levels of illumination, in the sense of exploring surroundings in a dark space; the option of triggering simultaneously up to eight channels of sound, to create layering, texture and

uninterrupted sound; and the option of silencing the sounds currently playing. These features help the user's movement within, and control of, the environment. Each time the user "plays", s/he will learn to recognise more clearly how the structure works and how it is possible to play with it.

The space is a large rectangular container of all the categories and other graphic elements. This shape makes horizontal and vertical navigation accessible; the user is changing spaces without transforming completely the graphic space. This is achieved thanks to the navigation bar permanently on the right. To the right, the coloured rectangles contain a keynote sound⁶⁸ per space, which allows interplay with the categories. The keynotes represent sonically the gestures of each space. Each category contains a list of sounds and images played sequentially. The spaces are organised in such a way that they create layers able to play sound simultaneously, and fade in and out according to the user's interaction, creating a multimedia texture. The mix among categories gives a sense of the space and allows the user to establish relationships among the sounds. This is how repetitive sounds in themselves can create particular acoustic environments derived from the soundscape within the journey. The sound gives the sense of movement in the space. The still images change sequentially; some of them (on escalators and in carriages) change by slowly fading in and out.

During the fieldwork the researcher provided another form of reality expressing techniques of interaction between commuters and the soundscape. It was noticeable that in their activities, they try to maintain their individuality: reading a book, wearing headphones, or looking at personal objects. On the other hand, they write, or try to talk with friends. These elements were thought of as being sufficiently important to reflect in the interface. The voice is an important element in formulating perceptions of the soundscape; however, this element requires further research, as not all of the volunteers tended to talk or make comments when listening to the sounds of the Tube. Finally, text input was chosen as the means of registering the feedback of the users on a sort of blackboard in the background. Other volunteers can also gain access to these writings.

⁶⁸ These "keynote sounds" were recorded with the KM 184 stereo pair microphones. Even if some of them can be understood as sound signals, the researcher attempted to create representative atmosphere of each one of the five spaces. These sounds in fact can sound repetitive in the interface, but at the same time there is an attempt to "orient" sonically the user.

This feature creates a textual narrative constituting an outcome of the experience of the user in this environment.

2.2.3 Technology

In order to find the most appropriate technology for developing the project's objectives, the researcher took into account studies about leading technologies that use sound on the web.⁶⁹ According to Interactive Audio Special Interest Group, the most robust technologies for supporting multimedia projects are Java, Flash and Shockwave.

First came was an attempt to develop the project using Java, bearing in mind the need to create an open structure - which is not the nature of Flash and Shockwave⁷⁰ - that could incorporate a large amount of sounds and images linked to a database capable of compiling and retrieving them. Several disadvantages were found when working with Java: firstly, it supports .aiff, and .wav audio files, but not .mp3, which is the most popular audio format used on the web. Secondly, even if the possibilities of programming in Java were extensive, the most difficult issue for the researcher was to learn a complex language with no existence of a graphic interface to use in thinking creatively of the interactive process. In Java, each object and function used on the interface requires programming behind it, and the researcher needed support from a programmer⁷¹ to develop the application. The time between the programming and the option of seeing the results was very long. The creative multimedia process requires a permanent "taste" of the interface; by using Java, this factor was being minimised, yet the researcher wished to use more powerful technology. Furthermore, the difficulties experienced by the programmer in understanding the aesthetic concept behind the programming made this attempt confusing, slow and, in the event, unsuccessful.

⁶⁹ Applications suggested in the study "Interactive Audio on the Web (Review and Recommendations)" prepared by the Web Audio Working Group of the Interactive Audio Special Interest Group, were Java, Flash, Shockwave, QuickTime, RealOne. (December 2002) Published by MIDI Manufacturers Association, Los Angeles, CA <http://www.iasig.org>

⁷⁰ Flash and Shockwave final distribution applications (projectors) are closed and need to be updated by their authors to make changes. Files can be external, in the case of the sound, streaming sounds. However, the performance depends on the streaming speed (band width) of the Internet.

⁷¹ A Lecturer from the Department of Computing Science and Information Systems from Goldsmiths College, University of London, Dr. Ida Pu, offered support through a third-year BSc student, Khaled MD Al Faruq.

Based on the researcher's previous experience with Flash and Director, she decided to use Director and its compressed format Shockwave, and lastly to incorporate Flash Objects to make the text and the user feedback more dynamic. The main reason was that the researcher felt more comfortable working in Director because it uses Lingo as a programming language, already known to her. Next, Director software works with objects that can be displayed on a stage: it suggests the metaphor of a theatre where the objects, i.e., the actors, receive instructions to perform their own roles. At the same time these objects are linked together within the stage set and thus form part of the same story. The addition or suppression of any of the objects provides greater freedom to imagine and create the interface. In Director any element can have any kind of interactivity, according to its original source, namely, video, audio or image. Flash also allows this; however, the structure of the programme is reminiscent of the metaphor of the layers of an onion. It is, therefore, an added challenge to think of actions that do not imply movement through the frames, given that it is an animation-based programme. Flash is a very dynamic programme, with enormous development within the Web. The software allows the seeing of each object as an individual entity. These objects are then classified into buttons, graphics and movies. In Flash, as it is animation-oriented, or visual-based; therefore, it is harder to retain detachment between the elements. Flash is Internet-user-oriented, which can be seen as a great advantage; however, it has also created a "language" of how the interactivity should proceed according to this medium.

Director represents the actions that are taking place on the stage through a large table called a "score". This is divided into frames and sprites. Following the theatre metaphor, the frames represent the stage sets, while the sprites represent the characters. Director without Lingo could be understood as an animation programme, too, in which the movement is supplied by a sequence of frames. If the elements are distributed in frames, it is less easy to perceive them as parts of a whole structure and to establish relationships among them while programming and designing. Therefore, it was important for the researcher to have all the elements playing in one frame as visible and not visible objects in the creative process. Looking at the whole structure makes it easier to understand visually changes in colours and the perception of the virtual space that

represents a real space - even if the users will not see all the elements together, yet will nevertheless remember the visual space they occupy.

On the other hand, Director uses 32bits compression images. Although these are larger in size, they offer an image closer to the original picture. Flash makes the images brighter, and the light that it projects cannot be changed, as it may be through Director. If the background used is black, it is easier to think of these objects as appearing and disappearing on a stage, as objects that are being illuminated. Taking into account this current research thinking of *space* requires the metaphor of the theatre, which also involves perspective. The creative process is based on a real space where multiple elements are involved. Flash seems to impose its own aesthetic while Director seems to leave the characteristics of the objects as more natural. This reflection is, of course, a personal perception of the software, important to the creative process of the researcher.

This artistic experience reflects a sample of multiple memories that can be shared in the created structure. The structure has been fed by the fieldwork findings, such as shared memories of sounds, perception of space, perception of time, rhythm, sounds of machinery, and people's sounds. Particularly it has included all the sounds selected by volunteers in the third phase of the fieldwork, which have been organised in categories according to the movements that commuters tend to follow in their journeys. The sound technique used in the multimedia is layering. This technique is also used for the images, and for the multimedia structural concept. This creates the sensation of the space as *one* shared space with multiple variations, and creates textures, both sonic and visual. The graphic interface contains elements recognisable by commuters as materials from the LU. The navigation has been designed to be free, and for the commuter to control the movement in a sort of *dérive* practice. The multimedia includes options of reading and writing, so as to receive feedback from the user. These feedback tools have been inspired by the activities that commuters tend to engage in during their journey and are important elements in the process of remembering with respect to the chosen medium: the Internet.

In the third Chapter the pilot project will be described. Commuters were invited to interact with the multimedia structure and to experience a journey through fragments of different journeys. Two types of volunteers participated in the pilot project: volunteers that have followed the three phases of the fieldwork, and new volunteers with no knowledge of this research. This process concludes the cycle of data collection, in the model developed, to address the research conclusions and inferences.

3 CHAPTER 3 PILOT, ANALYSIS, CONCLUSIONS

The pilot project's objective was to test the Interactive Sonic Environment (ISE) and to receive feedback from commuters after their having fully experimented with it. This is the phase where the researcher's intentions are finally realised: she sees how the commuters' perception of soundscape can be changed through the interactive environment, and observes the processes of listening and remembering that are involved in the interactive experience. In this Chapter the researcher summarises the volunteers' responses and suggests possible changes for, and developments of, the ISE.

Based on the methodology followed during the research, the researcher analyses the findings and examines the results of fieldwork, artistic work and pilot project against the research's objectives. Lastly, the researcher evaluates the work achieved, explains its relevance, and suggests its potential applicability. This work brings together the course of the whole research; it offers further development, taking into account the fact that the Interactive Sonic Environment is a continuously evolving piece of sonic art.

3.1 Pilot project

The pilot was conducted individually with each volunteer. Sixteen people⁷² participated: ten were volunteers who participated in previous stages of the project, and six were new volunteers, also commuters. They played with the application, on a laptop (Macintosh G5) and with headphones, without restrictions of time, spending between twenty minutes and one hour experimenting; after that, they answered a questionnaire (*see* Appendix 11) regarding the journey experience and aspects of interactivity.

Based on these reactions, attitudes while interacting, and volunteers' answers to the questionnaire, the researcher summarised their responses, which involved: listening and remembering, navigation, perception of time and space, and creation of narratives.

⁷² Ten original volunteers: CD, SB, MA, LL, JW, DS, DO, MM, EM, and NM; six new volunteers: TP, ZR, MC, AA, BR, and JD

3.1.1 Listening and Remembering

According to the volunteers, the sounds are deeply evocative and in fact provoke an intense experience. With the interactive environment, commuters experienced a *sensitive listening*, described above as a multi-layered experience that involves memory and associations of an individual and shared experience. This action also implies listening to particular sounds that interest us. In Norman's terms they experienced *contextual and referential listening*, while others were "searching" for identifiable features of the memorable real experience (Truax's *listening in search*).

Some volunteers allow their imaginations to take part in the experience and they referred to this particularly through addressing the sounds with associations, identifying and distinguishing them, and conceptualising their meaning. In the case of associations: for one volunteer this interactive journey was most enjoyable because he was listening to and imagining what these sounds and these images comprised (DO); another volunteer closed his eyes and imagined he was in a warehouse (DS); for CD, sounds resembled water rushing at different velocities or "veins rushing". CD's perception was related to a metaphor expressed by a different commuter (AL) in the first stage of the fieldwork, who described the LU as "the arteries of London", "where the blood flows". The researcher thought that the experience of the journey was as if the volunteers were "reading" and interpreting other commuters' experiences.

There were accounts about concepts derived through sounds from the commuting. The intention here was to focus on a collective experience rather than isolated experiences. This is the case of MM, who described her experience as a world of sounds:

Each sound is a world; each sound is something that you live and enjoy but also something that bothers you. It is comparable with the daily life of each person. This is what it reflects, something that happens in your life, and suddenly it is a good sound, or some bad experience is a bad sound, something that makes you crash. It is related to the life, the sounds, with the world of each person. I identify there the experiences that I have every day, and I feel identified with them. (MM)

Only one of the volunteers (EM) felt no link at all between the real and the virtual spaces. She wanted to be represented through longer excerpts of her journey or her

voice. For that reason she did not feel the experience as a journey, because it was “de-personalised”, it was “other people's journey”, but not *her* journey.

I hear my voice but I didn't feel much of it, but it's also change, it's snippets. It's not continuity ... but having said that, the randomness was interesting as well, this probably says more about me but it might be maybe. (EM)

She was unable to establish a comparison, even if she heard her voice. What was interesting for her was her own recording (in the second phase of the fieldwork), where she revived memories. She is no longer commuting on a regular basis on the underground, and her memory is more nostalgic.

The researcher emphasises here that the volunteers *selected* the sounds; however, the process of editing by the researcher certainly omitted particular features important to this volunteer. Recording, selecting and editing sounds are valued processes for some volunteers, and are technical facilities to be improved in future experiences.

Other volunteers who participated in previous phases of the project also tried to identify their own journeys:

I can identify my voice very well and I can see that it was an anxious journey, the dog barking, the child behind. (CD)

MA said she felt as if she wanted to find what was hers, “the need of possessing something, or not, to find what is mine”. In this case she, too, was referring to her voice, and also to familiar voices; although other sounds were indeed familiar, she was referring to listening to people who speak her language, or other familiar features.

NM found familiarity in the space, even if he did not recognise the sounds that he selected: “but it wasn't necessary - at least it was my voice”. Here, it is important to highlight that his voice would be the only recognisable sound to characterise his particular journey. He also said that he did not like to record his voice. He failed to find his voice in the environment; if he had done so, it would be a different journey because

he would be looking for his voice instead of experimenting and listening to the others'; it would be "like going on a hunt". (NM)

The process of finding an individual feature through which to find one's identity is interesting; it is comparable with the desire for maintaining an individual space during the commuting routine, through their individual objects, as described in Chapter 2 (*see* p.62).

New volunteers found others' voices very attractive and they repeated, mimicked, commented on, or replied to them, as if they were actually talking to other volunteers or were very close to them:

That guy saying "apologise" that ... he never apologises, I didn't understand why ... It's like being close and so far away from each other and from ourselves ... (TP)

JD found the contrast between announcements in "Queen's English" (otherwise known as Received Pronunciation or RP) and its contrast with other accents interesting. Two new volunteers in particular were searching for voices that they usually hear in the real space yet were unable to identify in the randomness of the environment:

For instance, I was looking for conversations, to see if I could hear something, or like when you get involved with the conversation, but I couldn't find them. I found them but they were... unexpected. (ZR)

BR also wanted to have interviews away from the sounds. He said: "You will get people's anger. I didn't hear it. I would like to hear more of the human response." (BR)

These volunteers also found repetitive sounds that could have an effect of keynote sounds in the environment as it happens in the real soundscape:

At the beginning, it is very nice; the sounds are more clear, sophisticated, and more obvious. I recognise all of them and it is a daily life experience that we don't appreciate. After a while I get again into the (real) environment and I forget I am listening to different sounds, and again it becomes background. (ZR)

I found it a little repetitive. It is a bit zany after a while, but after a while people's conversations are more interesting than noises, I would like more people, more. It is a shame not to have the impression of people, more voices. (BR)

In contrast, BR noted the way the experience captured the real space and its mechanical character:

It is fine; it captures it. I was trying to identify the noises, of course, if this is the escalators or the train going alone, the doors closing. The underground is a very noisy place anyway. Continuous mechanical noises, and you are not interested if you don't know what these noises are, and then when you hear them in the recordings you can say, oh yes, this is the deep underground, the Northern, or Central, I can tell this sound is different when I travel on the Piccadilly or the Circle. I could actually hear the difference here and that amused me because I know the history, about the mechanics of the underground, because the train is absolutely booming sound, the echo. So I am aware of the mechanical differences ... (BR)

The researcher speculates here that new participants had a tendency toward *listening in search*, while original participants allowed themselves more freedom in listening, since they had already shared thoughts in the prior phases. It seems that the contribution made by early volunteers in the making of the interactive environment intensifies their involvement with it. However, the contributions of new volunteers were key factors, as the perception of machinery in the recordings was for them more powerful than were the voices, even though the voices had been identified as an important feature of the soundscape during the prior phases.

In the interface, it will be important to supply options within each category, allowing the users to play with certain isolated sounds such as only voices, the sounds of people's movements, or the announcements, if this is the user's wish. Even voices can constitute a sub-space, as can machinery sounds. As regards repetitiveness, the structure of the interface can prevent this by either including more sounds or increasing randomness.

The researcher had the option of including more commuter voices from the journeys or from other sources such as interviews. The comments from the journeys are rich and sensitive. But they have been triggered and selected following a methodology: the

commuters selected their voices or sounds in which their voices were included. For this reason, the researcher did not include more of this type of sound.

Following this idea and the development of interactive tools, the voice can be represented through a chat environment, which is a metaphor for the conversation. The option of including, within a multi-user version, the option of integrating commuters' voices over the soundscape can, furthermore, be studied. In this respect the virtual space is an opportunity to make the voice, represented by writing or as a recorded voice, a priority within the rest of the sounds that compose the London Underground's soundscape.

3.1.2 Navigation

The interactive environment was designed for non-expert users, and most of them have found it entertaining (even without its being a game) and easy to understand after experimenting for a while. Where navigation is concerned, two types of users were identified: one looks for a path to follow, while the other experiments with the interactive options through exploring the interface. The latter user's type of experience can be compared with the psychogeographical practice of *dérive*, where commuters experience "locomotion without goal" (*see* Introduction p.8), and can be related to the "playful creation" of all human relationships, as they experienced different ways to understand how the virtual space worked. Thus, navigation is related to the individual experience and response to the interactive applications; furthermore, it may depend upon the length of time spent experimenting with the interface.

3.1.2.1 Path

Four volunteers expressed concerns about having been given no path to follow. Some of them wanted to listen to every single sound and were concerned whether they had missed some element:

I wasn't sure if I had heard everything, and sometimes I was going to repeat it, and I thought, oh, I have done that section. But then this is a sort of method or the way how different people approach things. What I found frustrating about the Internet is that you don't know if you miss something big. Like, you have done that, tick boxes, but it doesn't work like that. (JD)

MA said she would have liked to know where she was going: "I don't know if combining things you can find a route to somewhere." (MA). She also refers to this feeling as a "surprise" factor and she stated: "I decide where to go, but I don't know what is going to happen." EM expressed the fact that she always uses "next" or "back" to go to the next phase, and she was "slightly overwhelmed" by this experience. She is used to being given guidance in interaction as regards the next step forward or back, and the lack of titles in the application meant that she had to work harder. She also said that it was unclear which icons she had "visited", and she wanted to hear all of them. For BR, the sub-spaces (speakers, trains and steps) were not clear; he emphasised his tendency to visit certain web sites that gave precise information:

But you don't know what is that about, it just leaves you asking more questions than getting answers, besides, from the sites that I use as a scientist and traveller, I need precise information. After a while it's that you realise it is an artistic experience. (BR)

Two volunteers experienced confusion over "travelling" between spaces, perceiving the spaces as lines and therefore asking whether it was possible to travel between lines. One volunteer (MC) was disappointed, commenting that the interface was not user-friendly: "You can explore, but it doesn't help you to explore." Another volunteer said that at the beginning she felt somewhat disorientated, trying to read the words before they disappeared off the screen, then she discovered the writing - and the whole experience improved for her.

3.1.2.2 A playful experience

For nine volunteers the experience was playful in different ways. One volunteer said, "[I]t is like a game, you can walk around, explore things." He said that it is different from other games. "[T]his one is exploring and listening" (DO) In comparison with

other interactive experiences such as games, the experience is described as giving more power and freedom to the user. Three volunteers found they had greater control over the virtual journey:

I can choose where I want to go. (ZR)

If you get tired you can change. (NM)

[H]ere, there is the variable of time. I can control the time. In the real journey I have to wait. This is an element of power in the computer. It is my journey, it is interactive and it is wonderful. (MA)

MM commented that even if she is not trained in IT⁷³, she finally understood what to do:

At the beginning I didn't know what to do, but I was discovering everything, following, following, and finally I understood what was going on. (MM)

NM, however, said that it was disconcerting because there was nothing to achieve. Finally he found himself playing as does a child, clicking to discover what would happen. "Adults don't do that, it is almost subconscious". He said that there is no obvious progression of images except as given by the rectangle on the right-hand side; it is a completely new experience for him.

Volunteers mentioned that the interactive sonic space requires time to discover because of the sheer number of elements in the spaces with which they can interact. JW said that he felt there is much more to discover, and he would like to explore it at leisure in his own time: "[M]aybe I was rushing a little bit try to sample as much as I could in as short a space of time as possible." Comparing this with other interactive experiences, EM commented that: "[T]his has got much more information, a lot in one thing." (EM)

DS said he was inquisitive; because he is not good with IT, he felt intimidated and for that reason the experience felt "jumpy", "clicking back and forward finding the way through." One informant (CD) said that this interface constantly demands attention. It can be funny and intense; she occasionally became confused, thus CD suggests it needs

⁷³ Information Technology

simple instructions: “I didn’t read the instructions properly” and “I am not very IT minded ... instructions should be ... like you are talking to a child.” SB highlights the fact that there are many options to navigate. More work and time are needed for a user to discover its possibilities, such as that of writing. “It takes time to discover the options, it is like a toy you start to know, but it is easy, and has recognisable parts and objects you need for travelling.” (SB) She added, however, that the fact that the interface is complex does not mean it is impossible or difficult.

The researcher would like to suggest that it is important to establish a balance between the artistic multimedia experience, on the one hand, and the navigation offered by this environment through working on the Internet, on the other. The medium has already influenced the method applied by some users in their approach to a space on the web. The interface should facilitate users' navigation without this resulting in the loss of the character of the environment: freedom, wandering.

It was a common feeling that the interactive experience requires time for it to be fully discovered. For that reason the researcher created a graphic guide illustrating all of the elements present in the first level of the environment, a “scale model” that can be consulted at any time. It is hoped that with this new graphic guide users can have a feeling of the structure and function of the interface before experiencing it, and yet maintain the “surprise” factor, since the precise meanings of the trigger points are not indicated. The user will still have a sense of exploring; with no expectations other than wandering through sound and images.

Other features were included, such as a coloured line above each space to note the *change* of space, and labels that described all the categories where the user is going. The user can switch on the “information” option and leave it on permanently if s/he wishes. The sub-space of announcements has also followed more clearly the logic of the spaces where the original announcement is situated.

3.1.3 Perception of time and space (Repetition-layering)

Having mentioned *dérive*, the following accounts could be understood as a *détournement* (see in Introduction) of the elements that were considered extremely familiar for volunteers, into “something else”. In the virtual space, commuters have changed the perception of space and time and the feelings produced by the soundscape. In the interactive sonic environment, the layering (both temporal and spatial) of different categories of sounds has revealed meaningful features of the commuting experience in a more intense manner than in the real space. For instance, CD said about the virtual experience that

[T]his is much more intense because this is in a shorter period of time. You have all these noises, all these sounds, these people talking, you go to different places, it's like nothing I heard before ... It is asking for you to be present in all these places at once so it's very intense. (CD)

The experience of a virtual journey was expressed as "good" and "a great experience", relaxing; for two of the volunteers, it was “therapeutic”. For JW, the virtual experience intensifies the pleasure of being distant from the real space: he refers to this virtual space as a comfortable zone and it accentuates the experience of how pleasant is to be away from the LU. He said that is very enjoyable and even therapeutic to work with it. This journey

[M]ade you aware of the anxiety, this piece you have made, because you are not aware of it, because you have to do *it* (the real journey). (JW)

JD said that her perception was as if it were a journey of a blind person, taking all other people away, closing her eyes. T and AA described it as a subconscious element that came with the experience and one that is built during the commuting routine:

Interesting. It brought up certain stuff that was unconscious, and experiences that I don't know, it's hard to explain, special effects maybe, perception? Waken the perception. ... There is stuff but there is something there, something subconscious, I don't know what is that but is very good. It went too quickly. (AA)

Normally when I go to the underground it's very straightforward, boring, but there are things that I perceive but they are subconscious, they are not, I don't pay attention to it, they are there, in my subconscious, I am not concentrating on them but they are there in my head. (T)

These accounts suggest that the memory is "buried in routine" (*see* Chapter 1, p.40) and is then "awakened" in the virtual environment.

SB said that the virtual journey gave her the option of creating her own perception. She explained how in the virtual journey there is awareness of the space:

I think that the underground is very busy but here you can realise it through little windows, all the significance of being there. Sounds of the train, people, children, different spaces... also for example it is a very different sound in the street than when you are in the underground. (SB)

Yet another volunteer confirmed that this virtual journey created awareness with respect to her real journey. This would make MM's daily real journey more pleasant:

Just looking at this programme I can realise that I live a complete world in the underground. One journey is one world... Obviously in the virtual journey you are more aware of the sounds and you can make of your journey a different one, not monotonous experience. Because sometimes I sit in the underground and... but if you want it more comfortable, you can listen to *this* [*she is referring to the interactive experience*] and then you go in the real underground and you could enjoy more, and you can arrive home happy. Because *this* makes the sounds not bother you, instead it makes the sounds help you to compare them with your real life, or with your taste, then you can make your journey more comfortable." (MM)

The sense of real and virtual space was mixed for two volunteers. TP stated that this experience was very similar to the real one, and she felt almost as if she were indeed in the Tube. She refers to London as a "city-with-two-cities", "one upstairs and one downstairs". Another volunteer said that:

[I]t's a virtual journey, to sit here and almost have your own journey and go across London even if you are here and it's quite strange. At one point I closed my eyes, ah... I almost imagined I wasn't in the Tube, to see if the sounds were from somewhere else, certain sounds, I think, when the train, it's going to the tunnel slowly, and no one was talking and it made sounds that could be associated

with being in a huge sort of warehouse, for instance. The sounds seemed very distant if you didn't know that was a Tube journey, yeah, it put me in a different space but very quickly very recognisable sounds came back to make you realise that it is a Tube journey, the sounds of the door and the driver. (DS)

DS also made comparisons with a real experience of meeting people in the Tube, by chance, and in this virtual journey, recognising a patch from a school-friend. He made references to the real London, and snippets of sound from other spaces with which he is familiar.

Two volunteers talked about how this experience has transformed their perception of the real space. One, LL, said that this virtual journey was different because instead of being in an alien environment assaulted by sounds, which is how she perceives the Tube, she felt enveloped by the sounds:

It's a womb-like sound, you are back into, it's surrounding you, it's very, it's like white noise in a sense, it's no particular agenda. It's not particularly like... this issue about the accents that I was putting. It's lots of different voices, like humanity washing over you, and you are part of there but you are not being accosted by it, you are not forced to interact necessarily with it. Therefore it's womb-like which is enveloping, it - you are surrounded by... It was a kind of re-comforting; it was really nice. I would like to continue playing; it's great. (LL)

Here we see a commuter making an explicit connection with the womb metaphor mentioned in the first Chapter: our unconscious desire to return to our first sound environment, and the fascination with “watery” sounds and voices, a feeling of isolation from the exterior environment. Another mentioned that the real space of the LU is also transformed:

Such a quotidian space - that can be seen from a very cold perspective - is transformed into scenery of social distension, meeting, and the music is filtering through all spaces. (SB)

She also said that the two spaces are very different. “This is an artistic journey”. In the virtual one, “you are the spectator; you are not a participant”, for instance:

[W]hen someone talks about a terrorist act, or something like that; if that happens in the real space you heart will accelerate, but here you see that more as a social concept, more intellectual. (SB)

Both SB and LL emphasised the mixture of elements that makes the experience rich for them:

I liked the interaction between spaces, sounds and perceptions. In the interviews, people say really key things about LU, even if what they say is very short. This gives an idea that the LU means lots of different things for each person. For some it is a medium to observe, or something very emotional, children with fear, adults, music. (SB)

I was amused that sometimes in some of the places it seems to be a bit random, you have a series of tapes playing certain images and the images also moved from place to place and no, I think it was quite an interesting idea as well to link it with colour. So you have different lines and it's interesting. (LL)

Particularly talking about images CD highlighted the fact that:

There are images that - much easier - I relate to them, like the steps, and some are very obvious, like the doors, the tickets, and others are more abstract, that - there is a nice graphic thing, I like those as well. Umm yeah, I'm thinking about the images... (CD)

EM mentioned that the images are very modern, although she was listening to very mechanical sounds. She identified the various materials of items in the carriage, such as the fabric of the seats and the wooden floor. MA was looking for the relation between sound and images. "I found the images beautiful and even if the images are abstract, you know where you are. This is part of a journey, to know where you are." (MA)

In one case a volunteer expressed greater fascination for the images than for the sounds:

Visually it is very attractive. ... the little light of the machines. It made me think that I observe the same things, in the seats, I think that many people focus on the seats' print and try to find a logical pattern. (ZR)

In the final environment the image has been slanted even more towards abstraction to avoid seeking a direct relation (and confusion) between images and sounds. The images have been created by taking parts of a single picture (macrozoom) without applying any

process of transformation, maintaining the essence of the space, emphasising their textures.

The layering between sounds mixing diverse spaces and times has created an idea of a new space for the volunteers. This space involves symbolic ideas and it relates to the subconscious. Both the interactive and static elements of the interface seemed to contribute to a change in the perception of the real space without being detached from it. Interactivity experienced here has been related to navigation, in which perception, attitude, and modes of listening are transformed.

3.1.4 The Internet

The interactive characteristics described above gave a particular sense of how users interpret this work and its characteristics in the medium of the Internet. The virtual experience is related as new, yet it is compared in some aspects with certain interactive experiences: in museums, such as with guides showing the way through the museum, or a multimedia project representing people from ancient cultures through interactive objects. One volunteer remembered a college project in which he used snippets of London sounds. For the rest of volunteers the Interactive Sonic Environment was a new experience. They share the opinion that being on the Internet is good; they thus plan to visit the Internet site. They expressed several reasons for doing so: to grasp the feeling of the city; to compare it with their own country and, in the case of volunteers born in Britain, to compare it with underground experiences abroad; to have a pleasant sensory experience; to have fun, and to look for new and different sounds:

I am a person who, since my childhood, has enjoyed sounds. I remember that on the radio, at home, sometimes the signals had interference with signals coming, I guess, from other countries. Some of them were electrical. I used to listen for them because I loved them. In this case I would like to be using this interface, listening to things... (MM)

Three of them established certain conditions for visiting the Internet site: to have more time, and maybe a path, to have more writing and discussions; to have the interactive

environment in a museum (and not on the Internet) or in a space that relates to the environment, somewhere related with transport or the city, as the Internet is used “for more practical things”, ZR said. One volunteer said that he is not sure if he would like to visit this site if it is linked to the LU web site, because it has negative connotations for him as a daily traveller. Another stated that he would visit it, but does not know how frequently that would be.

The Internet allows the commuter to have his/her own space and the time to explore the interface at leisure. The researcher considers it is beneficial to state the independence of the work from the London Underground web site, because the impression the LU transport system makes on commuters is not necessarily wholly positive.

One volunteer responded favourably to the suggestion that commuters upload sounds and images, saying that his experience would thereby be more creative. MA speculated about possibilities of creating a sequencer based on those sounds; then commuters could edit and compose their own tunes using components from the LU soundscape. She talked about a game where she can have an aim to achieve, for instance: “[P]art of the writing is like discovering the game, something secret, so you need to guess something.” (MA) Another volunteer wondered, when she saw the text written on the screen, if other people would be able also to feel and “see” these sounds. CD imagines how this writing can become a chat environment, and how it would bring a feature that is not present in the real soundscape, in the commuting time:

[T]hink if, perhaps, you put a little chat room where maybe, like, people can also interact, like no, you are wrong, it doesn't sound like samba, no-o, I don't think so, ah yeah, sometimes it does, I know, what do you mean, a kind of conversation in the underground, ah... because people don't talk in the underground, so this is a chance of talking about the experience in the underground. (CD)

Based on these comments, single-user and multi-user options were considered. It is now clear, however, that even though the interactive experience could take a variety of forms, the experience that the researcher wants to emphasise for the user is the activity of “wandering”. In the future, the researcher hopes to link it with other sound

environments and to develop more interactive tools to promote the creation of narratives derived from the sonic experience. Uploading sound and images will be possible once the database is designed to receive, classify and retrieve this material.

3.1.5 Creation of narratives

Regarding narratives, the researcher focused on two aspects: the sound-driven narrative, which includes aspects of musicality, and written narratives that can be derived from the sonic experience.

3.1.5.1 Musicality

The researcher wanted to discover more about the perception of musicality that users could develop with the environment, since they had talked about the musicality and rhythm of some sounds in earlier phases. As was described in the second Chapter, the use of time, space and memory in a musical discourse of the commuting experience was a prime consideration during the creation of the Interactive Sonic Environment. The interface took the structure of “the journey” as a main narrative, providing a framework for the development of this discourse. Layering had already been incorporated into the interface in order to create textures of sounds.

Given these musical goals, during the pilot the researcher recorded the interactive experience in a sound file⁷⁴ to gain an understanding of how the commuters would become involved with the environment, noting spontaneous reactions to the interface, comments, and memories not derived from interviews (*see* Appendix 10).

The researcher was expecting that volunteers would respond with their voices, taking into account the fact that they could be engaged with the rhythmic soundscape. Some of the volunteers did express their feelings through their voices, while others found the written text very important as a means of expression.

⁷⁴ Sounds triggered in the Interactive Sonic Environment, and sounds of the commuters’ voice during the interaction, were recorded through a software package WireTap Pro installed in the computer. The voice was captured with the built-in microphone. These files are understood as the record of the experience.

In the sequences that were recorded, the sounds were layered in some journeys while in others the volunteers played individual sounds until these finished. Here, it is important to highlight that the action of clicking is what created the continuity of sound, rather than any automation present in the interactive environment. Some journeys were very fragmented; others kept a sense of rhythm while having assemblages of sounds followed by silences, making short scenes of their journey. In other cases, at the beginning the sequence was disjointed; after a while, when the user was confident with the interface, the sequence had greater consistency, with improved management of the changes between spaces and silences. For instance, one person spent eighteen minutes in the first space alone. The researcher was somewhat impatient at this length of time, because of personal motivations of hearing the mixing between different spaces, but after hearing the recording the researcher realised the user had been enjoying the experience, as was evident from his later comments.

Three of the volunteers refer to the musicality of these LU sounds. One found in the sounds of the LU musicality that she never imagined could exist in that space (SB). Another mentioned how she liked it when sounds overlapped, because it sounded “like polyphony” (MA). Some of them experimented with the repetition of sounds, particularly with the keynote sounds. They found them easy to trigger because of the rollover and the graphic interface. One new volunteer, MC, felt lost in the interface and was hesitant to listen to the sounds. He was clicking randomly on all icons without finding sounds that pleased him. He said the LU is “horrible” and that he wanted to keep away from it. He calmed down and played with keynote sounds, repeating them constantly. He commented that the only way to make these sounds “musical” is to make them abstract, “so they are not Tube sounds any more.”

In contrast, CD found that the memories brought back by the sounds, some of them unpleasant, are transformed by this experience:

I don't like those memories and others were really so soothing because some sounds there are so musical and it appeals to me and you just wanted to rest, because they can be both, like, very irritating. And they can be very soothing and

musical, the sounds of the underground. So there are particular sounds that I like very much, they make me feel calm, I like them; others I don't. (CD)

In this case memory is linked to *sensitive listening* in the sense that it is a multi-layered experience involving memory, time and navigation (exploring the space). The researcher made an inference in the first Chapter about the perception of musicality based on the continuum proposed by Truax: “speech, music, soundscape”. Taking into account volunteers’ responses, she wonders whether the musicality discovered while they were interacting is due to the counterpoint heard in the soundscape between the speech (meaningful and evocative for commuters) and the gestural sounds of machinery. On the other hand, it is also possible that the perception of musicality in the experience has been achieved because of the user's control over triggering sounds, leading to the creation of a personal dynamic of listening. In any of these cases, it is certain that memory is an important element linked to that perception, and also to the individual experience that volunteers have had with the real environment.

Two elements are identified here to highlight the perception of musicality: first, continuity, which is achieved through navigation and second, the variety of sounds, achieved through users’ contributions. The new graphical interface designed for guidance clarifies the options for exploration, and this can “provoke” more sounds being played together: layering. Once the option to receive users’ contributions is implemented, the environment will have a greater variety of sounds and will offer the user the option of selecting sounds using different criteria: for example, there might be a greater preference for abstract sounds, i.e., those having no voices, sounds from particular lines, or other categories.

3.1.5.2 Textual narrative

Reading and writing were initially two discrete tools in the interface. Some background text taken from the interviews was noticeable; it was accessible through **R** and **W** tools.

One volunteer (T) was somewhat at a loss at the beginning: she saw the words, and thought that by clicking on them she would be able to read them, yet suddenly she went to another space. She realised that she was doing “two things at the same time”, thus when she discovered how to interact with the reading and writing, it went well.

The writing was seen also as a tool with which to reply to the original text and an attempt to establish communication with other commuters. It is a strong tool and there were suggestions such as: “having different texts in the different spaces”. (CD) Some asked for assistance and/or permission about writing. For one of them, MA, writing was distracting. She claimed that it isolated her from the sound:

[I]t is as if I interact, but this a presentation of what is there, not about what I am doing, I would like to write but I didn't feel, like, with the wish, what do you want me to write?... (MA)

When writing, volunteers were very pleased when seeing their comments published in the background: “I like the typing and publishing,” one of them said. Text written without giving the name of the author brings anonymity and freedom: “We are anonymous (are we?) ... lots of freedom. It makes it more human, the way that people have written like that.” (EM) SB said that the idea of the words was great “in dispersion because the meaning is more poetic, and it works to have different perceptions. It is not something direct.”

The application was asking no particular question. For that reason, the excerpts written⁷⁵ were understood here as free feedback⁷⁶ from the experience with the sonic environment. The texts are snippets of comments, too (as are the sounds) and they offer a sense of continuity with the sounds. Volunteers used the text in different ways:

It's all so loud and everywhere there's an echo. When I heard Camden, I could smell it... Everything sounds familiar, although I recognise none of it from my own journey.

⁷⁵ These texts were written by volunteers during the pilot developed between 29 August and 2 September 2005. Other excerpts have been added by new volunteers later on.

⁷⁶ The reactions offered by users in writing or speaking about the interactive experience.

Me parece que el metro es un mundo al que pertenecemos sin darnos cuenta que día a día lo disfrutamos. I think the Tube is a world to which we belong without noticing it and from day to day we enjoy it.

I think this is a tube station with two routes to go. All these sounds, to me, are very relaxing and the pictures are very colourful, with strong colours. They represent a lot about the sounds produced by the trains, machines and people. This experience has been great.

Certain sounds of the trains can be distant and far; others present strong feelings of claustrophobia. The sound of the tube doors closing I find reminiscent of sounds from the steam age.

It's kind of very pleasant to listen to an environment which has a lot of anxiety, hassle and noise, in a space where you are away from it. You are in a comfortable zone and it's comfortable not being in it. Not being in the underground.

It's gentle and soothing listening to the anxiety of the underground in the comfort of somewhere away from it.

Aquatico. It's aquatic.

Wow, what an amazing soundscape. It is the accent of the world condensed into a synthesized experience making human of what I had always thought of as a mechanistic and rather alien environment. And in a stream of consciousness I find myself cushioned by the almost white-noise effect of the tube surrounded and reassured by the voices. But the voices aren't affected or forced or conveying any particular message.

I associate the tube sounds with a beehive, buzzing, buzzing, full of seemingly chaotic yet connected sounds, sounds that reassure through daily ingrained familiarity, cosseting one, gently lulling us into a stupor for which the heart and mind promise honey.

How strangely odd that a collection of sounds so organised should evoke a taste and one so reassuring and warm. What they are is a whole series of different accents, some I think I recognise, some I don't, but all very human and, most importantly, warmly human. It gives me the sense of being amongst people, not threatened but conjoining, sharing, being and all in motion. Strange ... I'd never have consciously thought this before now.

The sounds left me with quite an empty feeling - they are such cold sounds. In the recordings, because they are so clear, they sound even less human. Just a giant machine. All the emotions I felt when actually making the journey didn't return to me upon listening to them. It felt very detached. I wonder if others felt that? If you take away the human voices, the corridor is a scary place - repetitive sounds and a huge echo. They sound like effects from a horror movie. The visuals are modern, very up-to-date, and there is no doubt that they have been taken recently, but the

noises could have been taken from a different time, they are almost nostalgic. Grinding, sliding, whooshing, scraping, tapping, thudding - the sounds also appear to be disconnected instead of what they really are, which is just one part of a huge machine.

They are mechanical, but separate, like viewing each individual ant in an ant colony under a microscope. It's really interesting to hear what the other volunteers say - emotionally, it sounds very different to the way I felt. One guy sounds like he treats it like some kind of military operation - he is on the attack and the journey is the enemy. Another woman sounds just so tired by the whole experience. I think mine is an anxious journey. Did you hear my breathing? The feeling of isolation, the feeling of all belonging together to the journey...

The Tube is a many splendoured thing.

El sonido bajo tierra es como el de la tele cuando no hay emision o el de la piscina y me duerme. alo? tan chévere que es escuchar backgrounds familiares en el sitio incorrecto. The underground sound is like the one of the TV when there are no programmes or the one of the swimming pool - it makes me sleep. Hello? It is so nice to listen to familiar backgrounds in the wrong place.

The text written by volunteers reflected individual feelings, while they showed a collective sense of the experience; it involved a consciousness of features not perceived in the real environment, and provoked a broader perception.

In terms of narrative, two approaches were taken by volunteers: some saw an experimental poetic writing, where each text is a continuation of the previous text, and the result (not organised) can be read as a sort of poem; others saw words as being possibly linked with other text (i.e., as Hypertext). The researcher thought that it would be important to access the text through categories. However, new text might not fit the categories derived from the fieldwork, since these new texts are related to the experience with the *virtual* space. The ideal situation would be that users decide which keywords apply to their own writing, and create new categories derived from the experience.

In the final artwork, the excerpts of writing appear sequentially on the initial screen before proceeding to the sonic environment. It is important to notice that there are two versions of the work: a CD-Rom version and an Internet version. In the CD-Rom

version the reading of memories is part of a single screen. In the Internet version, the writing is part of the shockwave, as feedback of the sonic experience, while in the section “Listening and Remembering” it is possible to write comments to the perceptions that the Interactive space has triggered. Two kinds of writing are involved: individual sound memories not triggered by the interface, and the writing that acts as a feedback to the interface. This option requires an aggregation system⁷⁷, proposed by the researcher as a future modification yet still under-developed in the current manifestation.

In this interactive environment, the processes contributing to the narrative are the listening experience, the remembering, and the writing. These in turn register memory. The process of remembering in the interactive sonic space has involved text, voice, sounds, and images representing memories. The feelings of each of the volunteers differed widely in the real space (they varied, for example, from a sense of freedom, at one extreme, to a sense of oppression, at the other), yet they combine in the sense of a common familiar space where people have different perceptions about a common past. In the virtual space, the common space itself has been re-experienced. Visitors are willing to express their respective memories and they may find them either sympathetic or contradictory to others’ experiences. Thus, the aural cultural memory is subtle, without a specific or restricted meaning: it was created - while each was interacting - as part of the experience.

The fact that the interactive sonic space has been created for the web in turn creates the notion of using tools to serve these communication options. Written text could be developed as a textual narrative derived from the sonic experience. The textual community defined by Wertsch, represented in excerpts of text, could become an imagined community with a space that works as a “site of contestation” (*see* Chapter 1, p.42).

⁷⁷ An aggregator is defined on Internet as “a type of computer program (such as application software or a web application) that collects syndicated Web content, such as RSS and other XML feeds from weblogs, podcasts, vlogs, and mainstream mass media websites.” <http://encyclopedia.thefreedictionary.com/RSS+Feed+Reader> Accessed 08 June 2006

3.2 Analysis

The researcher has previously presented analyses of volunteers' accounts, first, in Chapter 2 with respect to the fieldwork and artistic work, and, in the Chapter 3 with respect to the pilot project. These analyses have provided the background against which to state the results of this interactive experience involving soundscape, collective memory, and interactivity.

In this section, the researcher will highlight the main findings of the study, as regards interactivity developed from the relationship between commuters and the London Underground soundscape through a model that involves the processes of listening and remembering.

Below the researcher first explains how the creation of the artwork is a response to the initial research questions. Then, the researcher describes how the fieldwork fed the artwork, noting especially the progression of the listeners from a background listening to contextual and reflective listening, as well as the experience of a sensitive listening with the virtual environment. Next, she describes the relation between acoustic and textual community, where the former led to the latter, wider option of creating sound-driven narratives. Finally, the researcher highlights the importance of the "voice" as an element that deserves further research within the LU acoustic environment.

3.2.1 Interactive Sonic Environment

Interactivity has been developed through the processes of listening and remembering, two processes that both contributed to understanding the meaning of the experience of commuting and informed the artistic work. It is important to recall at this point the initial questions of this study:

How do individual experiences of listening to the soundscape during the commuting daily routine in the London Underground (LU) form an aural cultural memory for the inhabitants of London?

How can these individual experiences of listening give us elements of the soundscape that represent the real experience of the journey and, secondly, how can I create a virtual space allowing these aural memories to be shared, faced and transformed?

As a result of the present study the researcher asserts that there is an aural urban cultural memory of the commuting daily routine reflected in individual experiences of listening to and remembering the London Underground soundscape. Through volunteers' accounts the study has shown their common feelings towards the soundscape that relate both to soundscape elements (such as sound symbols, keynote sounds, sound signals and sound marks) and to listening habits derived from urban soundscapes from the Industrial Revolution and modern soundscapes. The sonic experience in the LU for commuters is full of feelings and sensations linked to a diversity of type of sounds, the perception of space and the perception of time in the routine. These feelings are attached to the "movements" where the sound is involved. One element that involved these feelings is rhythm. The rhythm is related to the individual's movement and also to the movement of the machinery within the routine journey.

Given these shared feelings towards the space, the study has led to the creation of an Interactive Sonic Environment. Layering has permitted those different sounds, spaces and rhythms to mix. Layering has made of the individual experience, for some of them just a "boring" routine, a very intense listening experience. Different soundscapes establish relationships, and people's experiences are mixed, as the user is controlling the appearance of sound in each space. In this sense, transformation of the sonic experience from the real to the virtual environment has taken place.

3.2.2 Creative process: progression of processes of listening and remembering

Throughout the three phases of the fieldwork, different modes of listening were identified in the volunteers, whose awareness of the soundscape increased from *background listening* to *contextual* and *reflective listening*. (See Table 2)

In the first phase of the study memories were related to nostalgia, such as schooldays, or the first time an individual travelled on this “remarkable” transport system. Anecdotes involving sounds were remembered as being poetic, curious, funny, or uncomfortable experiences of commuting. The meaning of the sounds was mostly subjective, through associations forming part of their respective life experiences. *Background listening* and *listening in readiness* were identified. Each commuter expressed how s/he had created his/her own set of sound signals to navigate physically in the real space, often ignoring except subconsciously the signals that have been designed for passengers in the LU. Within their routines, commuters associate feelings with sounds, with their own movements, and with the operations of machinery. Sound signals, keynote sounds, sound symbols and sound marks were identified from their accounts; these elements were understood as constituting the shared memory.

The development of the artistic work at this point was fed by aesthetic characteristics, such as the perception of time and space, and layering was seen as the means of bringing together commuters’ memories. However, the categories that would compose the space were nevertheless subjective. The use from their accounts of voices expressing memories would tend towards a categorisation based on oral memory about aural memory. This option was insufficient to capture the essence of those relationships with the soundscape that the researcher wanted to achieve.

The experience of commuting led to another perspective when, in the second stage of the fieldwork, commuters experienced their current actual travelling routines. The previous stage had made them more aware of this familiar environment and, as a consequence, in this stage they listened as if in search, yet also followed their normal routines. This element brought to the recordings a different character of memory

TABLE 2. Contributions from each phase of the fieldwork to the artwork

MODEL		INTERVIEWING	TRAVELLING	LISTENING
FIELDWORK Perception of a shared space	LISTENING	Background Listening Listening in Readiness Referential Listening	Listening in Search	Contextual and Reflective Listening
	REMEMBERING	Subjective memories Individual set of sound signals Feelings attached to sounds Identification of some sound symbols (shared)	Confirm some memories Commuters stimulate conversation They talk about absent sounds	Shared sounds Shared spaces
ARTWORK Creation of a space to share	INTERFACE	Categories by associations - type of sounds Perception time and space	Main narrative: the journey Commuters' vast knowledge of space	Categories by movement Sub-spaces Sounds overlapping space and time. Layering
	INTERACTIVITY	Large amount of memories (Sequences) Sense of exploring the space Freedom in contrast to control Individual activities: writing and reading among others.	Continuity of sound, between spaces Decision to take routes, to navigate in the space.	Need for silence (gaps between sounds) Tools to write memories when they are listening

impossible to gain through an interview. In this sense, spontaneous conversation made of it a personal experience - one shared, in this case, with the researcher. The researcher elected not to adopt the role of interviewer in this phase.

For the artistic work, the fact that commuters were aware of their movements in the space defined the main narrative of the interface: the journey. The important issue was the experience of the journey rather than the focus on certain sounds and their meanings. The manner in which their memories were expressed during our real journey was through comments or conversation. This behaviour led to the later development of the writing and reading tools in the interface.

The third phase involved the commuters' gaining perspective on their individual routines. As they were listening to their recordings, they were reflecting on a larger number of feelings associated with these - and also on feelings of others (*contextual* and *reflective listening*). In this phase, they selected meaningful excerpts of the sounds of their journey. The selection confirmed certain features in terms of sound symbols, such as announcements, and included other features considered less important in previous phases, such as steps, the train's arrival, and the sounds of the doors.

For the artistic work, the most important decision made at this stage was to categorise the sound memories according to the space in which each sound was recorded. The main spaces and sub-spaces comprising the structure of the interface were defined. Therefore, some individual memories not previously linked by the researcher found a “shared space” now to connect them. The artistic work brought together all individual experiences represented in the commuting experience, taking into account time, space and memory.

The specific sounds selected by volunteers from the recordings were actually mixed with other sounds that had not explicitly been selected, so that it was difficult for the researcher firstly, to differentiate and secondly, to isolate them. This was another reason for capturing larger movements and events in which the selected sounds were involved.

In the pilot project, the virtual environment provoked a *sensitive listening* in the volunteers. (See Table 3) It allowed the perception of a wider, more meaningful, and richer space because it constitutes one space comprising many individual experiences of listening to, and remembering, a common space. The event of commuting was experienced from a perspective different from the one expressed in the fieldwork. With the layering, the interactive environment allowed the comprehension of a meaning of the collective experience rather than of separate memories or accounts of individual experiences. The isolated sounds embodying a meaning for commuters were, in the interface, in contrast with other sounds that may have been insignificant in the individual experience. In this sense, the commuting is linked to their respective lives, personalities or experiences, while at the same time it is linked to others' lives, making of the interface a shared memory. The shared memory is also related to the sound symbols and, perhaps, to the memory buried "in routine", as has been stated by cultural memory scholars, for instance, Bal, Crewe *et al.* Such symbolic content could be brought to the "surface" after this experience.

The virtual space led to the sounds' being more clearly heard, since the elements were categorised and separated. In the interface, volunteers highlighted types of sounds heard, such as "voices" and "machinery". They did not notice noise and silence in the same way as they had in the real space, because they now had control over switching and listening to other sounds, or over silencing the whole aural image. The interface includes automated fade controls that balance the sounds. The listener is the soundmaker (in Truax's terms) in this new interactive space, because his/her context is very familiar and also because s/he can control when a sound or combination of sounds is heard. The navigation through the interface can create, through sounds, a musical discourse of the commuting experience. The perception of the space is utterly individual and almost endlessly variable.

Sensitive listening, then, involves primarily feelings that belong to a known individual experience, but which through the Interactive Sonic Environment become wider in space and meaning as diverse perspectives of listening are heard simultaneously. The created space allows listening in a single space to new sound textures, allowing the

TABLE 3. Main results of the Pilot project

	INTERACTIVE SONIC ENVIRONMENT	
PILOT PROJECT	LISTENING	Sensitive Listening
	REMEMBERING	Meaning of the collective experience rather than of separate memories or accounts of individual experiences.
	INTERACTIVITY	Free navigation: transforms the experience of the real space Narratives: 1. Perception of musicality 2. Interaction stimulates writing

generation of different perceptions and memories of the commuting experience. This makes the commuting culturally meaningful, for it becomes possible for the commuters to sense the existence of an aural cultural memory and to transform it. This “listening”, in turn, stimulates “writing”, understood as the formation of new memories of soundscape, sharing meanings of the experience. The development of these responses is linked to the interactive tools offered by the environment.

The Interactive Sonic Environment is the result of studying an acoustic community. This research has taken individual experiences and collected them together in a single representative space. This *implicit* community becomes an *imagined* community that is able first, to expand the acoustic community, and second, to create a textual community, a group sharing texts and experiences in order to enrich and transform their daily experience with the soundscape.

The final environment is a multi-layered space of sounds in which users experience a *sensitive listening*, navigating through five spaces and four sub-spaces. These are represented in the interface by abstract images taken from the LU, images representing the materials where the sound is reflected. The environment contains contributions (meaningful sounds and texts) made by commuters, taken from the journey experience. The voices heard were recorded during the experience, and are a response to the soundscape.

In the interactive space, the structure of the journey has been taken as the main narrative based on categories classified by movement. Through this structure the user is able to listen to elements of soundscape such as sound signals, sound marks, keynote sounds and sound symbols. During the interaction, these elements, which are memories taken from the original narrative (the journey), overlap in time and space making of the environment an evocative site of shared commuting experiences. The activity proposed by the artwork is one of “wandering”, or free navigation. Navigation allows, through the resultant layering and sequencing, the perception of a musical discourse of the commuting experience. It is a single-user multimedia application that embodies collective meaning. The whole of the virtual space and the feelings triggered by it

become the focus of the experience, rather than feelings triggered by individual sounds or experiences.

3.2.3 The Voice

Voice as a response to the soundscape is a clear issue that should be explored. This seems to be one of the closest elements of people's feelings in the London Underground's soundscape. During the fieldwork and in the pilot, the dynamic of the journey has been nourished by passengers' conversations and comments made by volunteers during their journeys. In the pilot, volunteers stated that they missed hearing voices, and that they searched for voices in the interactive environment. The researcher considers that the study has dealt with the intentions of different voices. The voice of the first accounts collected in the interviews is different from the voice recorded during the journey. In terms of memory, the voice of the interviews is more nostalgic, and implies a distance from the context. The voice recorded during the journey is part of the soundscape and gives a different character of the experience. This is linked to the context, as it is mixed with the sonic space, and it has the spontaneity of the daily routine. The researcher suggests that this is an important characteristic: to feel the interactive sonic environment as a space that keeps memory in the present. This voice is also different because it is the voice that reacts towards the soundscape in the real context. The voice is one of the most attractive elements in the soundscape and suggests the existence of a fresh soundscape where the human voice is understood as a primary element.

3.3 Evaluation

The model combining fieldwork and artistic work developed by the researcher was appropriate to understanding individual experiences of listening and linking them in a representative virtual space. During the fieldwork the commuters' experiences were related to particular sounds or events remembered from the daily routine; in the virtual space (in the pilot project), however, the experience was related to a whole environment

of sounds: it was transformed. The feedback received from commuters was, in the phases of the fieldwork and the pilot project, vital to informing the artistic work. In this sense, this research has constituted a reflected experience supported by an aesthetic and intellectual concept, itself informed by theory and fieldwork.

The theoretical background linking two areas of knowledge - soundscape and collective memory - was essential in supporting this research project. The former takes the sound as the primary interface through which to approach and understand the context (soundscape) and its creative potential. The latter allows an approach towards understanding individuals as narrators of real-life experiences, in a process of sharing memories. Together, these make the development around the term “interactivity” possible. This concept surpasses a technological relationship concept (user/interface) on its way to more subtle processes involving individuals’ feelings and experiences of daily life. Human processes are projected creatively through technology.

The three phases of the fieldwork brought layers of memory in the optimal sequence: the character of the recordings and the information would not have been achieved if, for instance, the recordings had preceded the interviews. The researcher elected not, in the first phase, to ask for sound files from commuters because she considered that individuals who lack expertise in dealing with sound recordings (either recording or editing) or lack Internet skills would thus be excluded from the research. For that reason, although volunteers chose the sounds, they were dependent on the researcher’s editing and recording process. However, recording the journey themselves, after the commuters had been interviewed about their commuting, gave the experience an intensity of immersion that may otherwise have been lacking.

The software package, Director, was chosen because of its robustness. Flash was considered, yet failed to incorporate the components necessary or desirable for a structure such as the one that has been built. However, it is important to link the dynamism of Flash with the qualities of Director. The decision taken in terms of technology suggests that design and the aesthetic concept should predominate over

technological advances, rather than *vice versa*. In this research the intention goes far beyond mere technological specifications: the project is served by technology.

3.4 Relevance

This study establishes a convergence from different areas of knowledge, in particular soundscape studies, new media art, and collective memory. It thus makes a contribution to soundscape studies by approaching the sonic environment from the perspective of its “inhabitants”, making of it a new creative space in which to share experiences related to the meaning of the soundscape within the experience of urban transportation. The researcher has demonstrated that the interactive experience provided the commuters with a different perspective on the soundscape, an altering of their perceptions. It offers a different perspective of the real space, making the experience more intense (in time and space), and creative, in that the commuters have interactive elements, such as control of navigation, with which to explore this environment. The collaboration expected from potential users in the form of their files and text will augment the random options, the richness, the diversity, and thus their understanding of the soundscape. The experience of contributing to the interface stimulates the creation of textual communities, developing narratives of daily life as based on the perception of their sonic environments. Through technology the extension of cultural tools to create those narratives is proposed, where individuals reflect their individual experiences - contributing at the same time to a shared space.

In new media art including electroacoustic music the research makes a contribution in that it proposes interactivity based on the social processes of listening to and remembering a daily life context, which form part of a sensitive, sensory experience of the soundscape. Familiar sounds are represented in a different space, offering another perspective, which is the addition of listening perspectives. The interface extracted the essence of the environment, through an ethnographic study that nourished an artistic work. The researcher was able to create a multimedia structure incorporating the significance of the sonic experience of London Underground soundscape, based on commuters’ memories. Within the routine experience of travelling to and from work,

the researcher proposed a different way of approaching narratives from the perspective of the listener in the virtual space.

As regards memory, cases have been studied about events from the past, or objects shared by a group of people. The present study has dealt with a *contemporary* acoustic environment, shared by people who are not acquainted but who, because they have shared the same acoustic environment, are part of an *acoustic community*. With the existence of a virtual space, this study acknowledges the existence of a shared aural experience and promotes the re-creation of aural memories of a particular space as collective memory yet from the perspective of individuals. This artwork, on the Internet, is an evolving environment. Therefore, its material offers substance for further analysis from different disciplines interested in exploring urban culture and sound-driven narratives on the Internet.

3.5 Applicability

The development of a higher number of interactive tools can generate a textual community derived from an acoustic community, and can expand the acoustic community sharing other commuting experiences. The options of interaction and collaboration will be larger and thus the variety of sound, text and image combinations richer.

The creation of a database would be required to receive and organise contributions from users according to the categories established by the research. The database would increase selectivity during navigation; the user has a wider range of choices - e.g., to interact only with voices or with sounds belonging to certain lines - and this factor could inspire dynamism in each interaction.

The recording quality of the London Underground sounds is still an issue as regards eliciting collaboration from different users; it remains so for several reasons, such as safety regulations in the LU and the necessity to supply suitable resources such as specialised equipment to record in the underground. The researcher considers it viable

for commuters to collaborate with sounds recorded on mobile phones and send them to the Internet from this device. Of course, this possibility will need further development and testing.

Another branch in the further development of this environment is the creation of voice-driven narratives in this new space. For instance, if the users have a multi-user application that allows speaking over the soundscape - in other words, a chat environment with real voices - it could constitute an important feature of communication and live memories. Following this idea would be interesting to motivate conversation in the virtual space, such as that actually offered by the P2P telephony network used by Skype,⁷⁸ popularly used on the web. This real interaction is thought of as a system where users have an account and “meet”, in any of the spaces of the interface, where they can perform an interaction with their voices. In that sense, ideas that have been touched on, such as a commuter talking to her/himself (*see* Chapter 2, p.112), could be developed. In that case, commuters would not be seeking their own voices, but listening to other voices in the environment. This option could have as a precedent the inclusion of a chat log, where the voice is represented by text.

3.6 Future opportunities

Studies derived from this research can be executed in a shorter period of time in other cities with underground or other public transport systems. It is possible to create multimedia structures (virtual spaces) based on other routine’s (relationships) experiences with soundscapes (real environments). During the process of ethnographic research, the technical tools and equipment can be provided to the participants for the recording, selection, and editing of the sounds.

The interface created in this research can establish links on the Internet to other sonic experiences involving other underground systems all over the world. For instance, from the London Tube, it would be possible to go to the Paris Métro, and perceive another

⁷⁸ <http://skype.com/products/explained.html> Accessed 16 March 2006

aural environment, through a link established among the categories. In this manner the aural experience of commuting will become wider, shared, and have other possible destination points.

The researcher would like also to explore and develop this environment as an installation in which, with headphones and a microphone that records users' voices (memories), commuters could interact with the space.

3.7 Conclusions

Multiple experiences of listening to the London Underground's soundscape from the commuting experience create an aural memory of London akin to historical accounts of urban sound, to London's soundscape, and to symbolic experiences of urban sound transportation.

The new, virtual space acts as a meaningful abstraction of the real space, constituting an interactive artwork that enables us to create our own meanings of a shared contemporary urban experience. In this research "commuters" were understood as an implicit community; in the virtual space, they become an imagined community, with no loss of the notion of the real space, and are provided with the opportunity to re-create the virtual space through memory and the senses.

These interrelated memories form an intimate and meaningful listening experience based on sounds from the LU acoustic community, which could in turn lead to the construction of a creative textual community on the web. Those communities could grow *via* the world-wide web through the sharing of acoustic experiences of commuting all over the world. Collaboration from users would enrich the web environment with more sounds and images to feed into the multimedia structure.

The soundscape implies the development of an acoustic and textual community through the creation of narratives with the use of cultural tools such as sounds and images, and

also of technological tools to develop the reading and writing. Within the interactive tools the individual space of each commuter should be recognisable and represented.

Given that the relationship established by users between the processes of listening and remembering involves sound perception, musicality, navigation, images, a mixture among elements, and reading and writing text, this research establishes the basis for multiple connections in which the acoustic community of the London Underground and its textual community develop simultaneously within interactive media.

The commuting journey in the London Underground is usually seen as a story of how to locate ourselves in the city; it can, though, also be the story of how, by listening and recalling, we can find ourselves in a rhythmic environment with others, with ourselves, at a particular time in our lives and our life in the soundscape.

APPENDIX 1

http://londonunderground.blogspot.com/2004_04_01_londonunderground_archive.html#108155736762979191

Saturday, 10 April 2004

Listening on the Tube

Participants required - Sounds of the Underground

If anyone is up for this, there's a genuine request to take part in research for someone's PHD. Ximena (top name) originally left a message in comments a few weeks ago and I followed up the enquiry. I've simply cut and pasted part of Ximena's follow-up email below, so that I don't get anything wrong:

"I am doing my PhD in Music, Technology and Innovation at De Montfort University in Leicester. My research is about the sound world or soundscape of the London Underground and what people would remember of it, we might call it cultural or collective auditory memory. I need for the sample 30 volunteers from diverse backgrounds.

This is a cultural and artistic project open to all ages. The conditions to participate in the project are: to be a commuter (this is to have a routine travelling by The Tube at any time, line and route), and also to be Internet user or to be attracted by technology.

First, I need to have a chat with volunteers either in May or June. I am arranging appointments for it. In the next academic year (starting in September 2004), I will need a bit more of their time for a practical exercise of listening and sonic creation."

Anyone interested please email Ximena Alarcon to find out more.



I'll be too busy listening to my toons to take part, but it might be quite fun if you want to have a go.

posted by Annie [Saturday, 10 April 2004](#) [Add & view comments \(1\)](#)

Comment 1

The sounds people remember from the tube?

Three words: Mind the gap.

Sheesh. And someone's getting a PhD from this? alex | [Email](#) | [Homepage](#) | 11.04.04 - 4:48 pm | #

APPENDIX 2

Commuters' bios

AA: Andres Arias is an independent researcher interested in “energy”. He has lived in London most of his life. He commutes but most of the time prefers to be at home.

AL: Alex Learmont is from South Africa. He has lived in London for ten years. He can read a book per day or per week when travelling in the LU.

BR: Brian Rosen is a scientist from London. He has travelled almost all his life in the LU. He loves its mechanics and compared it with other underground systems in the world.

CD: Claudia Ferreira Da Silva is from Manaus, the capital of the Amazon, Brazil. She has lived in London for twenty-four years. She is a personal safety and self defence trainer, working with a broad range of organisations and individuals, and particularly women, in England and abroad. She loves animals and is amused by the 'little mice', creatures of the Underground.

CW: Chris Wood is from Newcastle. He has been in London for three years. He enjoys the sound of the wind in the LU.

DO: Daniel Ordoñez is a teenager, a piano student, born in Bogotá, Colombia. He has lived in London for six years and he wonders how crowded the LU would be if an event such as the World Cup took place in London.

DS: Daniel Sullivan is a Graphic Designer from London. He prefers to use paper to computers in creating his work. He has used the Tube for almost 30 years.

EM: Erin McQuade is from Sydney, Australia. She has lived in London for 23 years. From her first visit to London she keeps a picture of a poster showing a Punk, one of the first memories she had of the London Underground.

HH: Hugh Huddy is a contemporary music composer from Manchester. He has been in London for seven years, and the London Underground was one of the attractions for his move to London.

JD: Jill Darrell is a scientist from London. She has lived in London all her adult life. She loves to visit undergrounds all over the world.

JC: John Chantler is from Brisbane, Australia. He is a musician, living in London since 2003. He rode the underground for the first year or so before buying a bicycle.

JG: Jim Goodrich is from Hammersmith. He lived in London during his childhood and returned three years ago. He likes to take the first underground train at 5:45 in the morning to avoid the rush hour. He enjoys the silence of the many stations he has to go through to arrive at work.

JO: Jackie Osorio was born in London. She has a collection of editions of the *Metro* newspaper, and enjoys travelling with school friends in the Underground.

JW: Jerry Wigen is a musician who composes and improvises. He was born in North-east London and has used the LU for over 40 years. A particular sound he likes is that of machinery and axles which sometimes resemble the sound of whistling. He likes to imagine these sounds being made by real people.

LC: Luz Eliana Celis is from Palmira, Colombia. She has lived in London for eight years. She finds the sound under ground more 'refined' and the sound above ground quite 'rustic'. She found it interesting that people do not speak in the stations; the only sound is that of the trains.

LL: Lesley Larkum is a composer, violin teacher and orchestra director originally from Oxford, but she grew up in Sydney, Australia. She has been in London since 1988. She is proud of using her Brompton bike in combination with the Tube and buses to travel all over London.

MA: Monica Acosta is a Contemporary Music singer from Colombia. She has lived in London for seven years. She tries to avoid travelling on the Underground, which she finds suffocating. At the beginning of her stay, it was useful for orientation; now, she prefers to use her bicycle and the buses.

MC: Michael Chant is a composer and performer, born near Wakefield, Yorkshire. In 2002, he initiated the Not-In-Our-Name cultural project to provide the opportunity for musicians and artists in other genres to take a political stand in their cultural work and to contribute to creating an alternative culture to the present mainstream.

MJ: Marco Antonio Junqueira is a journalist from Sao Paulo, Brazil. He has lived in London for four years, always using the LU. He liked the commuting time to "think" and compare the rhythmic sound of train's wheels with Brazilian musical rhythms.

MM: Magda Muñoz is a Colombian who has lived in London for six years. She finds great satisfaction in helping people. She loves the Jubilee Line and sometimes travels on this line just for the pleasure of feeling that smooth train.

NM: Neil McConie is from London, but has spent most of his life in Northampton. He has lived in London for three years, travelling in the LU for the same amount of time. He likes to collect funny anecdotes of what happens during commuting, and to talk about them with friends.

RS: Richard Souray is from Richmond. He spent 18 years of his childhood and youth in London. He has recently finished his degree in English, in the University of York.

RK: Ryoko Kato is a Foreign Languages student from Japan. She lived in London for three years. She enjoyed sleeping in the LU; however, other commuters seemed to worry about her. In London it is not as common to sleep when commuting as it is in Japan, she said.

SA: Seye Aina is a lawyer. She is British and has lived for over 30 years in London; she recalls almost the same length of time of using the LU. She remembers long journeys with her father travelling in the LU, just for pleasure.

SB: Sofia Buchuck is a poet, singer and painter from Cuzco, Perú. She has lived in London almost 15 years. Music is significant for her in the LU environment: buskers, the choral groups that create a good atmosphere at Christmas, and the music from her CD player as it strangely changes pitch in the tunnels.

TP: Tyr Peret is a Brazilian psychologist, translator and Brazilian Portuguese tutor who has lived in London for 5 years. She is interested in art, literature, travelling around the world. At the moment she is living in Rio de Janeiro and looking forward to do her PhD in a near future.

TC: Tsai-wei is an artist from Taiwan. She is now doing PhD in sound art in a London university. Her research investigates Taipei sojourners' cross-cultural identities through environmental sounds of Taipei and London.

TG: Thomas Gardner is a composer and music performer. He is interested in interactivity and improvisation performances. He stopped commuting in the Underground and uses a bicycle.

YN: Yukako Nishide is an opera singer from Japan. Usually, the Underground is boring for her, but it is an environment where she can rehearse her singing. She found that in the Tokyo Underground there are more announcements than in the LU. She is curious about recording other environments and understanding/memorising the space through that.

ZR: Zulma Ramírez is a classical music singer from Colombia. At the moment she commutes between Paris and London.

APPENDIX 3

QUESTIONNAIRE PHASE 1

Introduction

Hi! Welcome. Thanks for participating in the research __name__ Where are you from?

How long have you been in London?

How long have you been using the LU? Why? (*reason for the routine*)

Did you bring an object significant to you, part of your routine? What is it? Why is it important to (meaningful for) you?

1. *Could you describe your actual routine?* Did you come by Underground, and how was it?
2. Do you have a different routine on different days of the week?
3. Does your journey change with the different seasons?
4. What is (are) the first memory (or memories) that you have of the Underground?
5. Do these memories remind you of other situations, people, or places you have lived before?
6. Now, thinking about the sounds you've heard on the London Underground, what can you remember about them?
7. Does the sound remind you of a different place (not an underground)?
8. Are there any sounds you don't like? What are they?
9. What sound makes you feel comfortable? Why?
10. Which is the most pleasant (friendly, likeable) sound for you?
11. What sound makes you feel as if you are in danger?
12. Could you describe any other feelings you have had listening to LU?
13. Do any of the sounds remind you of some particular situations or events?
14. Does the sound remind you of dates or special years?
15. Has any sound interrupted your activity or thoughts while you are travelling?
16. Are there any sounds that tell you something useful or sounds that help you during your journey? (sound signals) What do you remember about them?
17. Are you interested in recording and listening to different 'journeys' of your daily experience?

APPENDIX 4

LIST OF RECORDINGS

COMMUTER	DATE	WEEK DAY	TIME	DURATION	STATIONS: DEPARTURE AND DESTINATION	LINE(S)
CW	27/09/04	Monday	1.00pm	33'30"	Highgate to Goodge Street	Northern
MA	27/09/04	Monday	2.35pm	17'46"	Old Street to Camden Town	Northern
TC	27/09/04	Monday	4.50pm	26'22"	King's Cross to Vauxhall	Victoria
JG	28/09/04	Tuesday	5.40am	31'13"	Shepherd's Bush to West Hampstead	Hammersmith Metropolitan Jubilee
JC	28/09/04	Tuesday	9.40am	37'57"	Brixton to Notting Hill Gate	Victoria Central
MJ	28/09/04	Tuesday	11.05am	35'59"	Surrey Quays to Piccadilly Circus	East Jubilee
NM	28/09/04	Tuesday	5.10pm	33'39"	Baker Street to Seven Sisters	Metropolitan Victoria
HH	29/09/04	Wednesday	9.15am	22'11"	Finsbury Park to King's Cross	Victoria
SB	29/09/04	Wednesday	3.40pm	35'41"	Brixton to Bethnal Green	Victoria Central
SA	29/09/04	Wednesday	4.55pm	22'57"	Victoria to Hammersmith	District
JO	30/09/04	Thursday	8.20am	10'53"	Pimlico to Sloane Square	Victoria District
YN	30/09/04	Thursday	10.00am	26'57"	Wood Green to Oxford Circus	Piccadilly Victoria
JW	30/09/04	Thursday	4.10pm	45'37"	Holborn – Stratford – Holborn	Central
MM	01/10/04	Friday	3.15pm	26'12"	Bayswater to Fulham Broadway	District
EM	01/10/04	Friday	4.20pm	59'19"	High Street Kensington to Tufnell Park	Circle Central Northern
LC	01/10/04	Friday	6.20pm	55'23"	Golders Green to Shepherd's Bush (Ham)	Northern Hammersmith
DO	02/10/04	Saturday	1.30pm	19'30"	Fulham Broadway to Bayswater	District
LL	02/10/04	Saturday	5.30pm	13'24"	Vauxhall to Brixton	Victoria
DS	03/10/04	Sunday	1.05pm	35'49"	Arsenal to Shepherd's Bush (Central Line)	Piccadilly Central
RS	06/12/04	Monday	8.10am	28'00"	Richmond to Ravenscourt Park	District
CD	07/01/05	Friday	4.30pm	34'33"	Turnham Green to St. James Park	District

APPENDIX 5

QUESTIONNAIRE PHASE 3

1. How do you describe your routine after have listened to it in the recordings?
2. Do the sounds create images in your mind? Could you describe them?
3. Can you identify where this sound comes from? What does it remind you of?
4. Which sounds do you remember after recording that you had not realised before?
5. Does the sound remind you of any special materials: brass, glass, water, wood, wind, metal, etc? If so, could you name them?

Additional comments

APPENDIX 6

SAMPLE OF SOUNDS' SELECTED NAMES

ENTRANCE: Horse, Anxious-voice, Traffic-hum, Footsteps, Whale sound, Storm-child, Thunder

TICKET AREA: Coins, Electronic games

CORRIDOR: Steps, Train-pulling, Squeaking-escalator

PLATFORM: Upper-concourse, Concert-hall, Fundamental, Announcement-muffled, Funny-voice, Competition, Complaint, Chaos-hell, Chaos-emergency

CARRIAGE: Relentless, Tunnel-cavernous, Invasive-wheels, Tap-dancing, Tribal-dance, Tribal-bees, Sonic-violence, High-whooshing, Waves-harmonic, Happy-people, Steady-train, Waterfall, Demonic-voices, Victoria.

APPENDIX 7

Narratives result of personal journal

(Audio file CD 1, Track 1, Duration: 1'15'')

Notes: The purpose of this exercise was to perform non-linear sequences playing short sounds on the screen, with a simple sound player. The researcher followed by ear the sounds that she wishes to play in a sort of improvisation experience. The individual sounds had been previously transformed with different software experimenting with gestures and textures. As a player she found that the characteristics of sounds were guides to moving in that soundscape she was creating. Some sounds could emerge at any time, but others were strong in gesture and marked events in the narrative. If they were repeated, the result is almost surreal, and artificial. The researcher concluded that sounds should maintain their acoustic characteristics to feel a 'closer-to-reality' soundscape.

APPENDIX 8

Narratives with voices from the interviews

(Audio File CD 1, Track 2, Duration: 1'56'')

Notes: In this file, the researcher imagined a narrative, using volunteers' voices taken from the interviews. This excerpt takes the carriage as a space where different situations are happening simultaneously. The comments are related to activities the travellers usually undertake in the Underground. Trying to represent 'reality' again, the exercise presented an "unreal" soundscape. In the same manner as the previous file, the researcher was exploring sound-narratives that could result from the multimedia experience.

APPENDIX 9

Third phase of the fieldwork

(Audio file CD 1, track 3, Duration: 2'39'')

Notes: *See Chapter 2*

APPENDIX 10

Audio commuters interacting

CD 1, track 4 Duration: 1'19" and track 5, Duration: 1'40"

APPENDIX 11

QUESTIONNAIRE PILOT PROJECT

1. How was the journey experience?
2. How do you compare your original journey with this one that you have just had?
3. Does it relate to other experiences you have experienced before?
4. How do you feel with the interactivity, instructions, and interface?
5. If this multimedia were on the Internet, would you like to visit it?

Additional comments

BIBLIOGRAPHY

Àcs, P., Teller, J. (1997). *Pendler*. [CD-Audio]. Skræp: Copenhagen

Ackroyd, P. (2002). *London, The Biography*, London: Vintage

Alarcón, X. (1998). *Metro*, Barcelona: Support by QUAM.

Ajuntament (1997). *Metros y Metropolis*. Barcelona: Ajuntament de Barcelona

Antaki, C. (2003). *Analysing Talk in Interaction* [online]. Available from: <http://www-staff.lboro.ac.uk/~ssca1/lecture03CAroots.htm>. Accessed 20 July 2004, Loughborough University.

Augé, M. (2002). *In the Metro*, University of Minnesota Press.

Bal, M., Crewe, J. et al. (1999). *Acts of Memory, cultural recall in the present*. Dartmouth/New England, Hanover and London: Dartmouth College Press/University Press of New England.

Barbosa, A. (2003). "Displaced Soundscapes: A survey of Network Systems for music and Sonic Art Creation." *Leonardo Music Journal* **13**: pp 53.

Bennett, D. (2004). *Metro, the story of the underground railway*, Mitchell Beazley, an imprint of Octopus Publishing Group Ltd.

Brown, F. , James, S. (2000). *Subway Special a Democratic Platform, Aldwich Tube Station*. London: Wimbledon School of Art, Arts and Humanities Research Board.

Cusack, P. (2001). *Your Favourite London Sounds, London*. [CD-Audio]. London Musicians' Collective.

Davies, C.A. (1999). *Reflexive Ethnography. A Guide to researching selves and others*. London: Routledge.

Dinkla, S. (2002). *The History of the Interface in Interactive Art*. Available from: <http://www.maryflanagan.com/course/2002/web/HistoryofInterface.html> Accessed 07 August 2006

Drever, J. (2002). "Soundscape composition: the convergence of ethnography and acousmatic music." *Organised Sound* **7**(1): 21.

EARS (2004). EARS ElectroAcoustic Resource Site. [online]. Available from: http://www.ears.dmu.ac.uk/rubrique.php3?id_rubrique=203. Accessed 16 December 2005, De Montfort University's Music, Technology and Innovation Research Group.

- Eliade, M. (1960). *Myths, Dreams & Mysteries*. Great Britain: Harvill Press
- Elliot, J. (2005). *Using Narrative in Social Research: Qualitative and Quantitative Approaches*. London: SAGE.
- Emmerson, S. (1986). "The relation of language to materials". *The Language of Electroacoustic Music*. S. Emmerson. London: The Macmillan Press Ltd.: 17-39.
- Feld, S. (1994). "From Ethnomusicology to Echo-muse-ecology: Reading R.Murray Schafer in the Papua New Guinea Rainforest". *The Soundscape Newsletter* 8, June. Available from:
http://interact.uoregon.edu/Medialit/wfae/news_letter/08.html#Ethnomusicology.
 Accessed
 29/10/06
- Feld, S. (2004). "The Time of Bells 1. Soundscapes of Italy, Finland, Greece and France." [CD-Audio]. Santa Fe, New Mexico: Voxlox
- Ferrari, L. (1995). "Presque Rien." [CD-Audio]. France: Production Acousmatheque INA – GRM
- Garrioch, D. (2003). "Sounds of the city: the soundscape of early modern European towns." *Urban History* 30(1).
- GLA (2004). *Sounder City The Mayor's Ambient Noise Strategy*. London: Greater London Authority.
- Halbwachs, M. (1992). *On collective memory*. Chicago, London: University of Chicago Press.
- Halliday, S. (2001). *Underground to Everywhere*. London: Sutton Publishing.
- Hochmair, H. (2002). "Vienna soundwalk. A soundscape information system" in *Soundscape The Journal of Acoustic Ecology* Vol.5 Number 11:26.
- Kansteiner, W. (2002). "Finding meaning in memory: a methodological critique of collective memory studies." *History and Theory* 41: 179.
- Keiller, P. (1994). *London*. [videorecording]. London: Channel 4 (1997)
- Lockwood, A. (2004). " Sound Mapping the Danube River from the Black Forest to the Black Sea: Progress Report, 2001 – 2003" in *Soundscape The Journal of Acoustic Ecology* Vol.5 Number 11:32
- Lynch, K. (1998). *Good City Form*. Cambridge, Massachusetts, and London, England: The MIT Press.

- Mattelart, A. (1998). *Theories of Social Communication, a short introduction*, London: Sage Publications.
- McCartney, A. (2002). "Circumscribed journeys through soundscape composition." *Organised Sound* 7(1): 1.
- Mosquera, G. (1999). *Moebius*. [film]. Review Available from: <http://www.ram.org/ramblings/movies/moebius.html>. Accessed 28 March 2003
- Mota, M. (No Date). *Metro Indios Verdes*. [soundscape - online]. Available from: <http://www.kunstradio.at/RADIOTOPIA/contdetail.php?nav=6|1&peid=9>. Accessed 25 May 2006
- Norman, K. (1994). "Telling Tales." *Contemporary Music Review* 10(2): 103.
- Norman, K. (1996). "Real-world music as composed listening." *Contemporary Music Review* 15(1): 1.
- Norman, K. (1996). *London*. [CD-Audio]. London: NMC recordings.
- Paine, G. (2002). "Interactivity, where to from here?" *Organised Sound* 7(3): 295
- Peebles, S. (2001) "108-Walking through Tokyo" [CD-Audio]. Berkeley: Post-concrète records.
- Pile, S. (2002). "The problem of London, or how to explore the moods of the city". *The Hieroglyphics of Space: Understanding the City*. N. Leach. London., Routledge, an imprint of Taylor & Francis Books Ltd.
- Plant, S. (1992). *The most radical gesture: The Situationist International in a postmodern age*. London, New York: Routledge.
- Prelinger, R. (1996). *Our Secret Century*. [CD-Rom]. New York: The Voyager Company.
- Rüseberg, M. et al (2003). *La defense.stage urbain* [CD-Audio]. Germany: Realambient
- Rüseberg, M. , Werner, H.U. (2005). *Lisboa. Reloaded* [DVD]. Germany: Realambient
- Rüseberg, M. et al (1995). *Madrid: a soundscape collective* [CD-Audio] Germany: Realambient
- Rustema, R. (2001). *The Rise and Fall of DDS, evaluating the ambitions of Amsterdam's Digital City* [online]. Doctoral Thesis in the Communication Science. Amsterdam: University of Amsterdam.

- Sadler, S. (1999). *The Situationist City*. Cambridge, Massachusetts: The MIT Press.
- Schafer, R. M. (1994). *The Soundscape: our sonic environment and the tuning of the world*. Rochester, Vermont, Destiny Books.
- Schryer, C. (1997). *El medio ambiente acústico de México*, and *Vancouver Revisited*, in "Autour." [CD-Audio]. Montréal: Empreintes Digitales.
- Smith, B. (1999). *The Acoustic World of Early Modern England*. Chicago London: The University of Chicago Press.
- Stephenson, N. (1999). *Cryptonomicon*. New York: Avon Books Inc.
- Thompson, E. (2002). *The soundscape of modernity: architectural acoustics and the culture of listening in America, 1900-1933*. London, Cambridge, MA:MIT Press.
- Truax, B. (1999a). "Composition and diffusion: space in sound in space." *Organised Sound* 3(2): 141.
- Truax, B. (1999b). "Handbook for Acoustic Ecology." [CD-Rom]. Cambridge Street Records
- Truax, B. (2001). *Acoustic Communication*. Westport, CT: Ablex.
- Truax, B. (2002). "Genres and Techniques of Soundscape Composition as developed at Simon Fraser University." *Organised Sound* 7(1): 5.
- Truax, B. (No date). PENDLERDRØM. [online] Available from: <http://sfsound.org/tape/Truax.html> Accessed 28 January 2006.
- Waters, S. (2000). The musical process in the age of digital intervention. [online]. Available from http://ariada.uea.ac.uk/ariadatexts/ariada1/content/Musical_Process.pdf. Accessed 20 November 2003.
- Wertsch, J. (2002). *Voices of collective remembering*. Cambridge: Cambridge University Press.
- Westerkamp, H. (1996). *Transformations*. [CD-Audio].Montréal, Québec: Empreintes Digitales
- Wolkstein, D. and Kramer, S. (1983). *Innana: Queen of Heaven and Earth*. New York: Harper & Row Publishers Inc.
- World Soundscape Project Tape Library (1975). *London Subway*, recorded June 3, 1975. Europe Collection reel 81. Simon Fraser University

PRIMARY SOURCES

Interviews First Phase, date, place

Mónica Acosta (MA), 18 May 2004, The City University, London
Seye Aina (SA), 25 June 2004, The City University, London
Sofía Buchuck (SB), 20 May 2004, The City University, London
Luz Eliana Celis (LC), 21 May 2004, The City University, London
John Chantler (JC), 22 June 2004, The City University, London
Tsai-wei Chen (TC), 25 June 2004, The City University, London
Claudia Ferreira Da Silva (CD), 15 May 2004, her house, London
Thomas Gardner (TG), 25 June 2004, The City University, London
Jim Goodrich (JG), 18 May 2004, The City University, London
Hugh Huddy (HH), 22 June 2004, his office, London
Marco Antonio Junqueira (MJ), 21 May 2004, The City University, London
Ryoko Kato (RK), 21 May 2004, The City University, London
Leslie Larkum (LL), 18 May 2004, her house
Alex Learmont (AL), 24 June 2004, The City University, London
Neil McConie (NM), 21 June 2004, The City University, London
Erin McQuade (EM), 19 May 2004, The City University, London
Magda Muñoz (MM), 20 May 2004, her house, London
Yukako Nishide (YN), 17 May 2004, The City University, London
Daniel Ordoñez (DO), 20 May 2004, his house, London
Jackie Osorio (JO), 25 June 2004, The City University, London
Richard Souray (RS), 23 June 2004, The City University, London
Daniel Sullivan (DS), 19 May 2004, The City University, London
Jerry Wiggins (JW), 17 May 2004, The City University, London
Chris Wood (CW), 21 June 2004, The City University, London

Listening-selection of sounds third phase, date, place

Mónica Acosta (MA), 3 December 2004, her house, London
Seye Aina (SA), 27 January 2005, her house, London
Sofía Buchuck (SB), 3 December 2004, her house, London
Luz Eliana Celis (LC), 4 December 2004, her house, London
John Chantler (JC), 6 December 2004, London Transport Museum, London
Tsai-wei Chen (TC), 6 December 2004, London Transport Museum, London
Claudia Ferreira Da Silva (CD), 27 January 2005, her house, London
Jim Goodrich (JG), 7 December 2004, London Transport Museum, London
Hugh Huddy (HH), 17 January 2005, his office, London
Leslie Larkum (LL), December 2004, her house, London
Neil McConie (NM), December 2004, London Transport Museum, London
Erin McQuade (EM), 6 December 2004, her house, London
Magda Muñoz (MM), 4 December 2004, her house, London
Yukako Nishide (YN), 7 December 2004, London Transport Museum, London
Daniel Ordoñez (DO), 4 December 2004, his house, London
Jackie Osorio (JO), 17 January 2005, London Transport Museum, London
Daniel Sullivan (DS), 9 January 2004, his house, London
Jerry Wiggins (JW), 17 January 2005, London Transport Museum, London
Chris Wood (CW), 7 December 2004, London Transport Museum, London

Pilot project, date, place

Mónica Acosta (MA), 24 August 2005, researcher friends' house, London
Andres Arias (AA), 22 September 2005, British Library, London
Sofía Buchuck (SB), 1 September 2005, researcher friends' house, London
Michael Chant (MC), 31 August 2005, researcher friends' house, London
Jill Darrell (JD), 25 September 2005, her house, London
Claudia Ferreira Da Silva (CD), 31 August 2005, her house, London
Leslie Larkum (LL), 31 August 2005, researcher friends' house, London
Neil McConie (NM), 29 August 2005, researcher friends' house, London
Erin McQuade (EM), 31 August 2005, her house, London

Magda Muñoz (MM), 17 September 2005, her house, London

Daniel Ordoñez (DO), 17 September 2005, his house, London

Tyr Peret (TP), 1 September 2005, researcher friends' house, London

Zulma Ramirez (ZR), 21 September 2005, The City School, London

Brian Rosen (BR), 25 September 2005, his house, London

Daniel Sullivan (DS), 2 September 2005, researcher friends' house, London

Jerry Wiggins (JW), 1 September 2005, researcher friends' house, London