Embodying Heritage:
A Biosocial Investigation into Emotion, Memory & Historic Landscapes

by

Tessa Osborne

A thesis submitted to the University of Birmingham for the degree of Doctor of Philosophy

School of Geography, Earth and Environmental Science
College of Life and Environmental Sciences
University of Birmingham

ABSTRACT

This thesis examines the embodied geographies of heritage environments by discussing the various features and qualities of these environments in relation to the body. Emerging from, and contributing to, the increased emphasis on interdisciplinary and transdisciplinary studies in human geography and particularly developments in biosocial theory, this thesis develops an original approach to the study of embodiment within geography. This approach pays attention to the socio-cultural, material-built, remembered, and more-than-human environments that are present in urban conservation areas and the psychophysiological events that occur in this relatedness. In doing so, this thesis pursues two interlinked lines of enquiry: firstly, it develops and critically evaluates a biosocial methodology through the use of biosensing technology within a qualitative mixed-methods approach. In doing so, it discusses the effectiveness of biosensing technology outside of a laboratory setting and for investigating different areas of study in geography. Secondly, and drawing upon the residents' accounts of the urban conservation areas of Bournville, Moseley and the Jewellery Quarter (Birmingham, UK), the thesis discusses the various features (both in material and imagined worlds) that establish or contribute to an individual's connection with the urban heritage environments. Combined, these two lines of enquiry create a biosocial account of urban heritage landscapes.

ACKNOWLEDGEMENTS

This PhD would not be possible without those who kindly gave their time to take part in the research – thank you! A special thanks also goes to the various groups and individuals who promoted and supported this research; namely the Birmingham Heritage Group, the Birmingham Museums Trust, the Bournville Village Trust, the Highbury Orchard Community, Highbury Park Friends, History West Midlands, IDM Media, the Jewellery Quarter Development Trust, the Jewellery Quarter Research Trust, Cllr. Peter Douglas Osborn, the Moseley Exchange, the Moseley Society, Rosie Naseer, Nikki Pugh, and Suzanne Carter.

I would like to thank those in GEES who encouraged and supported me throughout the process, including Dave Adams, Gretchel Coldicott, Natasha Cornea, Rosie Day, Surindar Dhesi, Sophie Hadfield-Hill, Irina Kuznetsova, Gregor Leckebusch, Dominique Moran, Jon Oldfield, Paul Richardson, John Round, and Jon Sadler. Thanks goes to Jamie Peart and Chantal Jackson in the Map Library for the old maps of each area and having resolutions to all my strange requests over the years from ceramic tiles to graphic design. I would also like to especially thank Lloyd Jenkins for his friendship and support - both of which made the PhD an enjoyable experience. Our mid-morning coffees were a godsent during writing up!

Thanks also goes to the various research groups whose discussions have influenced this PhD greatly, especially the Biosocial Research Network, Geographies of Children and Youth Group, and the Digital Geographies Working Group. I was also like to thank Mark Paterson and Bernd Resch who both encouraged me to push the interdisciplinary nature of this thesis further and to Affrica Taylor, Angela Curl, Bob Stone, Christian Nold, Daniele Quercia, Deborah Youdell, Dorothea Kleine, Douglas Ragan, Gillian Rose, Günther Sagl, Jacque Micieli-Voutsinas, and Nicole Land for their advice and encouragement.

A great deal of thanks goes to my excellent supervisors; although it may have been difficult to get you all in a room at the same time, you were all encouraging, supportive, and patient with me. Firstly, thanks go to Jessica Pykett for introducing me to neurogeographies and guiding me through the whole process and helping me to explore other areas of geography where I could apply myself and biosensing technology. I would also like to thank Peter

Kraftl, would *actually* enjoyed reading this thesis, for pushing me to engage with theories that would have no even thought of considering and for your encouragement and support. Finally, major thanks go to Phil Jones for putting up with me for the last eight years. You are one of the kindest people I know and my time at UoB wouldn't have been as lovely if it wasn't for your support, mentoring, and friendship. I would also like to thank Julian Clark and Justin Spinney for being the internal and examiners of the thesis, and for their enthusiasm for this work and giving me a firm but fair viva and pushing this thesis further with their questions.

And for my colleagues at the University of Groningen: Bedankt aan iedereen over de faculteit Ruimtelijke Wetenschappen. Ik wil in het bijzonder Louise Meijering, Zeinab Sattari N., Carolina Lemus Way, Gert Weitkemp, Billie de Haas en Gijs Westra bedanken voor hun geduld, steun, en toestemming om 'sorry' te zeggen. En dankzij de leden van het Population Research Center voor hun steun en aanmoediging.

I would also like to thank a number of friends who supported me both academically and non-academically: Andy Chetwynd, Arshad Isakjee, Becky Hampson, Catrin Comeau, Deyala Altarawneh, Emily Guggenheim, Emily Warner, Helen Roberts, Husna Zaman, Ian Slesinger, Imogen Lester-Moseley, Isabel Williams, Jack Gray, Jannah Zainal, Jake Fisher, Jess Durdy, Mel Rohse, Tasha Keen, Rhiannon Blake, Sam Townsend, Thom Davies, Tom Disney, and the Bratby regulars. I would especially like to thank Tom Reynolds; the last few years have been a rollercoaster, but it has been an absolute delight going through the PhD process with you. Thank you for your support, kindness, cooking, gin, and trust.

Thanks go my family for pushing me to do what I enjoy and not asking too many questions about what the research was and always being there for me during all the ups and downs. None of this would have been possible without your support and love. Thank you.

FUNDING & PUBLICATIONS

This research was funded by the ESRC as part of a +3 studentship (grant number: ES/J50001X/1). Sections of this thesis have been presented at a number of conference and so have benefited from questions and discussions that emerged:

- A revised version of Chapter 3 appeared as "*Biosensing and geography: a mixed methods approach*" in Applied Geography and so thanks go to the editors and reviewers of the paper as well as the co-author Phil Jones (see T. Osborne & Jones, 2017).
- Further aspects of Chapter 3 and Chapter 7 appeared in "*Biosensing: a critical reflection on doing memory research through the body*" in "Doing Memory Research: New Methods and Approaches" (see T. Osborne, 2019) and as such thanks go to the editors, Danielle Drozdzewski and Carolyn Birdsall, and Palgrave Macmillan for their comments and support.
- Aspects of Chapter 8 were used in "*Ascribing Value: The Use of Biosensing in Heritage Landscapes*" in the Conscious Cities Anthology and as such thanks go to Anne Fritz and Itai Palti for their comments of the piece (see T. Osborne, 2017).
- Features of Chapter 3 and Chapter 6 have also appeared in a paper on methods for health geography currently under review in *Area*. I would like to thank my co-authors Ronan Foley, Sarah Bell, Heli Gittens, Hannah Grove, Alexandra Kaley, Anna McLauchlan, Andrew Power, Erin Roberts, and Merryn Thomas for their comments on my methods, and their support for my research.
- Aspects of Chapter 2 and Chapter 6 have been written into a paper on childhood nostalgias which is currently under review in *Transactions of the Institute of British* Geographers.

CONTENTS

Abstract i
Acknowledgements iii
Funding & Publications v
Contents vii
Figures xi
Tables xv
Abbreviations xvii

1 INTRODUCTION 1
1.1 Biosocial Geography 3
Emotion 3
Heritage 4
1.2 Biosensing Within a Mixed-Methods Approach 5
1.3 Research Aims & Synopsis 6

2 TOWARDS A BIOSOCIAL GEOGRAPHY 11
2.1 The Biosocial Approach 12
2.2 Biosocial Geography 16
Biosocial beginnings in embodied geographies 17
Visceral geography 22
Towards a biosocial geography 23
2.3 Biosocial Geography of Emotion 24
Geography, emotion, and affect 25
Organismic emotion and the affective sciences 28
Biosocial emotion: drawing together emotional strands 32
2.4 Conclusion: Introducing a Biosocial Geography 36

3 METHODOLOGY: PRACTICING BIOSOCIAL GEOGRAPHY 39
3.1 Interdisciplinary Mixed Methods 40
Biosensing 42
Mobile video ethnography 47
(E)motional mapping 49
Video elicitation interviews 51

Doing biosocial geography: an integrated methodology 52
3.2 Research Process 53
I. Ethical considerations 56
II. Recruitment & sampling 58
III. Data collection 62
IV. Data processing & collation 66
V. Independent analyses 68
VI. Combined analyses 76
3.3 Presentation of the Combined Data Sets 81
Annotated biomaps 81
Dashware video 83
3.4 Conclusion: Expanding Upon Biosocial Methodologies 84

4 INTRODUCING URBAN CONSERVATION: BOURNVILLE, MOSELEY, AND THE JEWELLERY QUARTER 87
4.1 Heritage Policy in Birmingham 88
4.2 Case Study Sites 90
Bournville 93
Moseley 99
Jewellery Quarter 104
4.3 Conclusion 108

5 DISSECTING URBAN CONSERVATION AREAS 109
5.1 Understanding the Body-City Relationship 111
Urban stressors 112
Urban restoration 113
Therapeutic landscapes 114
Developing upon the two-dimensional matrix 116
5.2 Memory & Nostalgia 120
Memory & emotion 121
Nostalgia 124
Place & nostalgia 125
5.3 Living Heritage; or Living with Heritage 127
Living in heritage 129

Heritage that is alive 131
Theoretical approaches to living heritage 132
5.4 Conclusion 139

6 URBAN STRESS & RESTORATION THROUGH THE THERAPEUTIC LANDSCAPES FRAMEWORK: SELECTED PSYCHOPHYSIOLOGICAL RESPONSES. 143
6.1 Experienced Space 145
Visual perception 145
Noise & conflicting attentions 151
Smell & the notion of 'freshness' 159
6.2 Social Activity 164
Social vitality 166
A preference for 'real' space 171
6.3 Symbolic Space 175
Spiritual atmospheres 175
Personal heritage & home 177
Atmosphere 180
6.4 Conclusion 184

7 NOSTALGIA 187
7.1 Personal Nostalgias 188
Remembering in space 189
The mattering of memories 196
7.2 Collective Nostalgias 204
Shared feelings of nostalgia 206
Material structures 211
7.3 Conclusion 215

8 NATURE-CULTURE & HERITAGE: EXPLORING LIVING HERITAGE SITES 217
8.1 Highbury Park: Cultural Landscape of Pluritemporality 218
The history of Highbury Park 220
Agricultural legacies in Highbury Park 223
Horticultural legacies of the Highbury Estate 230

8.2 Dereliction & Ruins: The Clash of Nature and Culture 235
Ruins as nature-culture in process 236
Sensing ruins 241
Ruins as an uncanny 246
Nostalgia for ruins 250
8.3 Conclusion 253

9 CONCLUSION 257
9.1 Establishing Biosocial geography Theory 258
Applying biosociology in geography 258
Emotional biosocial geography 259
A biosocial future for geography? 260
9.2 A Methodology For Biosocial Geography 261
Biosensing technology in geography 262
Establishing integrated analyses 264
9.3 On Psychophysiological Reactions 265
Considering absences or 'uneventful' data 266
Spatial and social scales 267
(Differential) biosocial experiences 268
9.4 Final Reflections 269

References 273
Appendices 333

FIGURES

Figure 2.1: Anatomy of the autonomic nervous system and its sympathetic (fight-or-flight) and parasympathetic (rest-and-digest) branches. 31
Figure 2.2: The mind-body layer-cake model 33
Figure 3.1: Urban Emotion Map – Cyclists' Emotions in Boston, USA 51
Figure 3.2: Flowchart of research process 55
Figure 3.3: Screengrab of recruitment advertisement on BVT website 59
Figure 3.4: Age and gender distribution of participants 61
Figure 3.5: Amount of time participants had been associated with the area. 62
Figure 3.6: Screenshot of raw data output from Empatica E4. 68
Figure 3.7: Screenshot of a complete biosensing and spatial data set. 68
Figure 3.8: Grounded theory coding. 69
Figure 3.9: Biosensing graph – Terence, EDA and HR. 70
Figure 3.10: "Biosensing map" – Max, EDA. 71
Figure 3.11: Standardised EDA map for Jerusalem 72
Figure 3.12: Standardised EDA map (>σ) 74
Figure 3.13: Standardised EDA map (<σ) 75
Figure 3.14: Environment-led analysis 76
Figure 3.15: Thematic-led analysis 76
Figure 3.16: Biosensing-led analysis 76
Figure 3.17: Coding matrix 79
Figure 3.18: Rick's EDA Map with visual and textual overlays 82
Figure 3.19: Screenshot from Dashware video 83
Figure 4.1: Detailed map of the Bournville Conservation Area 95
Figure 4.2: Bournville Conservation Area 97
Figure 4.3: Bournville Village Trust Area 97
Figure 4.4: Moseley Farmers Market in the 'Moseley Village' 99
Figure 4.5: Conservation areas of Moseley 100
Figure 4.6: Detailed map of the Moseley Conservation Area 102
Figure 4.7: Detailed map of the St Agnes Conservation Area 103
Figure 4.8: Jewellery Quarter Conservation area 105
Figure 4.9: Detailed map of the Jewellery Quarter area. 106

Figure 5.1: A stress model of urban impact 113
Figure 5.2: Visual representation of Gesler's triad of environments for a therapeutic landscape. 115
Figure 5.3: Matrix of therapeutic landscapes. 117
Figure 5.4: The Limbic Lobe and the roles of the various elements 122
Figure 6.1: Matthew's EDA map. 147
Figure 6.2: Matthew's BVP map 147
Figure 6.3: Video still from Max's walk 150
Figure 6.4: Video still from Alan's walk 150
Figure 6.5: Road traffic noise level maps for Bournville, Moseley, and the Jewellery Quarter 152
Figure 6.6: Michelle's EDA Map 155
Figure 6.7: Annotated version of Michelle's EDA map using video stills 155
Figure 6.8: Alan's EDA map 158
Figure 6.9: Max's EDA and TEMP Maps 161
Figure 6.10: Julie's EDA and TEMP Maps. 161
Figure 6.11: Mike's EDA and HR biodata 164
Figure 6.12: Video still, Michelle 170
Figure 6.13: Michelle's EDA and TEMP biodata 170
Figure 6.14: Rick's EDA map 173
Figure 6.15: An annotated map drawn by Rick after his walk. 173
Figure 6.16: Video still from Owen's walk of the canals in the Jewellery Quarter. 178
Figure 6.17: Owen's HR and EDA biodata 179
Figure 6.18: Video still from Rebecca's walk around the Warstone Lane Cemetery catacombs. 181
Figure 6.19: Rebecca's biodata 182
Figure 6.20: Amanda's TEMP map 183
Figure 7.1: Dan's BVP and EDA biodata 191
Figure 7.2: Dan's annotated BVP Map 192
Figure 7.3: Jeff's TEMP and EDA biodata 193
Figure 7.4: Julie's EDA Map with emphasis on Bournville Park 196
Figure 7.5: Terence's EDA and TEMP Maps 199
Figure 7.6: Terence's EDA and HR 200
Figure 7.7: Maria's EDA Map 202

Figure 7.8: Emily's BVP and HR biodata. 210
Figure 7.9: The Big Peg and Golden Square, the Jewellery Quarter. 213
Figure 7.10: Selly Manor 213
Figure 8.1: The outlines of the Highbury and Uffculme estates (1916). 221
Figure 8.2: The outlines of the Henburys and Highbury estates (1884) 221
Figure 8.3: The boundaries of land ownership in the Highbury Park area (2018). 222
Figure 8.4: Historical sites in Highbury Park. 224
Figure 8.5: The 1840 field boundaries on a satellite image of Highbury Park 228
Figure 8.6: Tony's EDA bio-map on a satellite image of Highbury Park 229
Figure 8.7: Video still from Tony's walk 230
Figure 8.8: Tony's EDA Map. 232
Figure 8.9: Video still from Tony's walk: The 'Angry Wall' 234
Figure 8.10: Video still from Tony's walk: The Peace Garden 234
Figure 8.11: Property utilisation in the Jewellery Quarter 238
Figure 8.12: Video still from Karen's walk. 240
Figure 8.13: Karen's EDA and TEMP biodata. 240
Figure 8.14: Karen's EDA biomap 242
Figure 8.15: Karen's EDA and BVP biodata. 243
Figure 8.16: Video still from Karen's walk 243
Figure 8.17: Rebecca's HR and EDA biodata 245
Figure 8.18: Mandy's EDA and BVP biodata with accompanying video stills. 249
Figure 8.19: Owen's EDA biomap 252
Figure 9.1: Martin's EDA and HR biodata 267

TABLES

Table 2.1: Definitions of targets of inquiry in the affective sciences 30
Table 3.1: "Dry" biosensor modalities 44
Table 3.2: Emotional responses inferred from biosensing readings. 44
Table 3.3: Empatica E4 Wristband sensors and frequency of data points 63
Table 3.4: Examples of interview questions, based around key themes. 66
Table 4.1: Comparison table of case study areas 91
Table 4.2: Property Age and Use in Jewellery Quarter. 107
Table 5.1: Dimensions of appropriation of therapeutic landscapes for analysing the restorative qualities of blue space. 118
Table 5.2: The categories and subcategories of UNESCO's understanding of cultural landscapes 135

ABBREVIATIONS

ACRG	Affective Computing Research Group
ALVA	Association of Leading Visitor Attractions
ANS	Autonomic Nervous System
ANT	Actor-Network Theory
BCC	Birmingham City Council
BVP	Blood Volume Pulse
BVT	Bournville Village Trust
ECG	Electrocardiogram
EDA	Electrodermal Activity
EEG	Electroencephalographs
EMG	Electromyograph
ERDF	European Regional Development Fund
ESRC	Economic and Social Research Council
fMRI	Functional Magnetic Resonance Imaging
GIS	Global Information Systems
GPS	Global Positioning System
GSR	Galvanic Skin Response
HR	Heart Rate
ICO	Information Commissioner's Office
JQDT	Jewellery Quarter Development Trust
MVE	Mobile Video Ethnography
NRT	Non-Representational Theories
PPG	Photoplethysmograph
PSNS	Parasympathetic Nervous System
SNS	Sympathetic Nervous System
TEMP	Temperature
UNESCO	United Nations Educational, Scientific and Cultural Organization
VEI	Video Elicitation Interview(s)
WHO	World Health Organisation

1

INTRODUCTION

As you sit and read the words on these pages, your body is subject to a variety of feelings. For instance, you can experience the feeling of your clothes of your body and the feeling of paper on skin when you turn a page. The motor-sensory receptors of your body are also receiving information about the amount of light in the room causing your pupils to dilate or contract. But whilst you concentrate on reading, however, you hardly notice or pay attention to these phenomena unless it distracts you because if your jumper is a little itchy or it is too dark where you are it can be difficult remain focused. Yet not all distractions come from your surroundings: your body may have needs; you may have a headache; be hungry/thirsty; or, feeling a little too hot/cold. Also, your emotions or mood may impact on the experience of reading – you could be in a bit of a bad mood, or be excited to see what the thesis holds, or just not 'feel like reading'. Whilst these feelings may be encouraged by your external surroundings (such as the smell of cooking making you hungry), the source of the distraction is from within your body and its reactions. And on top of that, there is a series of processes ongoing in and on the boundaries of your body that you are not aware of but still shape your experience. As you sat down to read this, your heart rate may have slowed because of little physical exertion, or you may be reminded of the nervous feelings you had before your own viva, and as such the memory could increase the flow of adrenaline throughout your body which can lead to increased sweating and feeling cooler as well as an increased heart rate. But even if you are feeling nervous or excited about lies ahead, emotions also have a social aspect where the physiological processes merge with conscious thought. For example, think back to when you were about to present a conference paper. In this situation most people

will be nervous, but many are able to mask this feeling and exude confidence even if they are 'bricking it' underneath. Also, the empathetic nature of humankind[1] means that emotions can be shared between people or evoked as a result of someone else's emotional state. The obvious example here is when you encounter someone who is upset and you allow yourself to be receptive to their emotions or even mirror their behaviour (Gallese & Goldman, 1998).

These feelings and embodied experiences are there whispering and shaping your experiences even if you are not aware of it. The body at any given moment is an assortment of various feelings and emotions, which are fuelled by our surroundings, experiences, and internal processes. Indeed, our interoceptive systems[2] contribute to the subjective aspects of emotion; you can always acknowledge the experience of these feelings and desires. Whether you are experiencing hunger or a chill, or how excited (or afraid) you are to continue reading. The feelings are a combination of two related processes in the brain-body-world nexus: the biological and the social. At a biological level, the limbic system[3] and neurochemical systems contribute to the precognitive embodied experiences of emotion. And at a social level, emotions are publicised with displays (such as facial experiences or word of mouth) and body posture. Importantly, these two aspects of emotion have subjectively and objectively observable qualities from asking the person how they feel to objectively measuring the reactions of the body, which hitherto had been difficult outside of a laboratory setting. As such, this thesis brings together these two major strands of emotion to develop a biosocial approach within geography to study emotion.

[1] Other species have been shown to be empathic, especially canines, felines, and simians (Bekoff, 2010).

[2] Interoceptive systems refers to the stimuli produced within the body, such as hunger or heart palpitations.

[3] The limbic system is a neurological network situated in the brain that is heavily involved in behaviour, mnemonic, and emotion responses and will be discussed in detail in Chapter 3.

1.1 BIOSOCIAL GEOGRAPHY

Although the primary contribution of this thesis is methodological innovation, it also introduces biosocial geography, using a case study of emotional connections to heritage landscapes. The term biosocial throughout the thesis refers to the interactions between biological processes and social experiences and behaviours. They are a growing theoretical approach in the social sciences with scholars from childhood studies, criminology, education, and sociology using it to investigate a variety of topics. Yet with geography's continued interest in the biological body, it is important to consider the possibilities that a biosocial approach could bring to the discipline, but also what geography's emphasis on the spatial could bring to biosocial theory. By incorporating methods and knowledges from the biological and social sciences, this thesis epitomises interdisciplinary scholarship and addresses these theoretical and methodological gaps. It will be shown how biosocial geography can be at the forefront of a reformed scholarship by responding to and incorporating paradigm shifts and methodological developments that have arisen from the biological sciences, especially neuroscience,[4] but considering them in relation to space in a critical way. As such, a biosocial geography is able to enhance the depth and range of knowledge uncovered as well as have a stronger influence on policy and society. In developing a biosocial geography, this thesis studies the emotionality of residents in three urban conservation areas in Birmingham (Bournville, Moseley, and the Jewellery Quarter). In doing so, the study touches upon two areas in geographical research: emotion and heritage.

Emotion

Because this research considers both biological and social realms in tandem, the thesis focuses on emotion as a means to investigate people's psychophysiology[5] in relation to

[4] Developments in the neurosciences include the discovery of mirror neurons (Gallese & Goldman, 1998) and neuroplasticity (Draganski et al., 2004), as well as technological advances with Functional Magnetic Resonance Imaging (fMRI) and affective computing (Picard, 1997).

[5] Psychophysiology refers to the connections between the mental (psyche) and physical (physio) aspects of the body and will be discussed in detail in Chapter 2.

urban conservation areas. Emotional connections with space and place have a long history within geography and the field now incorporates a range of interdisciplinary scholarship combining insights from cultural studies, gender studies, sociology, anthropology (among others) as well as a variety of philosophical approaches. In doing so, emotional geographers have been able to investigate the ways emotions emerge from and re-produce socio-spatial orders (J. Davidson, Smith, & Bondi, 2007). Emotional geography, however, has a tendency to focus on the socialities of emotion, and consequently emotions are understood to be quintessentially subjective deriving either from effable experience (cf. humanism) or the relational flows between minded-bodies (cf. non-representational theories). Therefore, there is a gap to explore what biological methods and knowledges may have if they are incorporated into geographical inquiries. For example, there is a collection of scholars in the biological sciences to advocate and practice an organismic approach to emotions.[6] The organismic approach conceptualises emotions as a series of physiological changes in the visceral body as a result of the neurological processes (see, for example, Keltner & Gross, 1999; Scherer, 2000). Consequentially the organismic approach has been able to use a range of physiological measures, such as electrodermal activity, heart rate, and neuroimaging, to identify and quantify emotional reactions. These accounts, however, are unable to evaluate the complexities of emotion and how it related to the wider world, like in geographical research. Yet the combination of the two, as it is demonstrated in this study, can work effectively together in the biosocial framework to enrich understandings of emotion and provide new areas of inquiry for geographers.

Heritage

Heritage, as a phenomenon that is inherited from the past, has been argued to rely heavily on 'emotional authenticity' (Bagnall, 2003; L. Smith, 2006; L. Smith & Campbell, 2016, p. 444) and, as such, "affect and emotion [are] essential constitutive elements of heritage making", thus demonstrating the important relationship between emotion and the past. In addition to the emotional significance of heritage, it also incorporates memory and the surrounding environment. I have demonstrated previously that memory is the epitome of a biosocial phenomenon (T. Osborne, 2019 and this will be discussed further in Chapter 4) but it is the consideration of urban conservation areas that brings all these topics together.

[6] The organismic approach will be discussed in detail in Chapter 2.

Urban conservation areas, as "an area of special architectural or historic interest" (Birmingham City Council, 2019b, n.p.), are examples of living heritage: spaces where the everyday practices of a population mix with preserved buildings and/or spaces. These spaces therefore incorporate personal, collective, and/or preserved memories in a unique physical environment. By focusing on urban conservation areas, therefore, this thesis is able to use a biosocial approach to investigate emotional connections to the physical environment (Chapter 6), memories (Chapter 7), and heritage (Chapter 8) - thus, demonstrating the various areas that a biosocial approach could enrich in future geographical scholarship.

1.2 BIOSENSING WITHIN A MIXED-METHODS APPROACH

Although this thesis does consolidate these tried-and-true conceptions of emotion in geography, it also considers both the psychological experiences (social) and a physiological responses (biological) of emotion – the psychophysiology of emotion. These psychological experiences are the focus of many emotion studies in biological and computer sciences (e.g. Peper et al., 2007; Picard, 1997; Resch et al., 2015) which have used biosensing technology to record and measure the physiology of emotions. Biosensing, as an umbrella term for a variety of different somatic measures, is a common form of assessment in psychology, neuroscience, and computer science but is rarely used in geography despite its possibilities within current geographical theories (Spinney, 2015). As such, biosensors can be seen as an opportunity to investigate people's reactions at the level of the body, allowing geographers to move beyond the subjectivity of self-reporting and narrative methods (Resch, Summa, et al., 2015; Spinney, 2015). I have previously argued that biosensing technologies could be seen as an inexpensive and objective ways to gather people's somatic and emotional responses to different environments (T. Osborne, 2019; T. Osborne & Jones, 2017), but should be treated with caution because such approaches run the risk of stripping the participants of their subjectivity (cf. Lupton, 2016) and are influenced by physical fitness and environmental conditions (T. Osborne & Jones, 2017). Even so, biosensing technology still remains a potentially powerful tool for better understanding the body and emotions and

for enriching established geographical theories, such as post-phenomenology (Spinney, 2015) and visceral geography (A. Hayes-Conroy, 2017). Despite excitement about the potential for using biosensing equipment, geographers have thus far failed to undertake a rigorous, empirically-informed analysis of whether and how these devices should be deployed in field research.

This thesis represents one of the first studies in geography to investigate the psychophysiology of emotion through the use of interdisciplinary mixed-methods including (1) biosensing technology, (2) video elicitation interviews, (3) Global Information Systems (GIS), and (4) mobile video. Aside from using these novel methods, this study goes beyond simply using biological and social methodologies and analyses in tandem (i.e. multidisciplinary research) by merging the datasets through an integrated analyses based on grounded visualisation theory (cf. Knigge & Cope, 2006) (i.e. interdisciplinary research). As such, this thesis examines the biosocial geographies of the urban conservation areas; particularly the multitude of ways in which these relationships can be identified and examined by, the psychophysiological processes of the emotional body. Interdisciplinary studies, such as this, can be challenging to undertake (see, for example, Callard et al., 2015; Setchell et al., 2017) and often require an experimental and exploratory approach (Fitzgerald & Callard, 2015), but approaching emotion in this novel way builds a clear conceptual and methodological understandings of biosocial geography.

1.3 RESEARCH AIMS & SYNOPSIS

This thesis demonstrates how biosocial geographies are an intriguing approach for geographers because it is able to consider embodied events and processes that were previously inaccessible or perhaps overlooked but also consolidate on the expansive scholarship on embodiment in the discipline. Not only could a biosocial approach enrich geographical inquiry, but it also has the capacity to expand knowledges in the wider social sciences because biosocial literature is yet to have a robust consideration of space, place,

and the environment. As such, biosocial geography has the opportunity to expand existing knowledges, encourage interdisciplinary collaboration, and hopefully uncover new insights into the relationship between people and their milieu in three case study areas in Birmingham. Although this thesis initiates a biosocial approach in geography, this is primarily achieved through the development of an innovative methodology that combines qualitative and quantitative methodological techniques to interpret the embodied geographies of heritage environments. In doing so, this thesis:

- develops a biosocial geographical account of the relationship between the body and its milieu;
- identifies and analyses the various features of the environment that influence people's emotions;
- and, critically examines the advantages and drawbacks of biosensing technology in research on the body in geographic research.

In order to address these research aims; this investigation will draw upon primary data from a mixed methods approach using biosensing technologies and qualitative methods. A total of forty participants[7] took part in the research which was carried out in three urban conservation areas in Birmingham in 2016. The thesis first develops a biosocial approach within geography (Chapters 2 – 3) before providing a context (Chapters 4 – 5) for the three empirical chapters on the physical environment (Chapter 6), memory and nostalgia (Chapter 7), and heritage (Chapter 8):

Theoretical/Methodological Background(s) - The next two chapters provide the theoretical and methodological framing for the thesis: biosocial geography. Through a discussion of biosocial work undertaken in other social sciences and geographical scholarship on the body, Chapter 2 develops the thesis' biosocial ontology by bringing biological knowledges and methods into (emotional) geography. It then turns to the main crux of this research, emotion, and develops a biosocial approach to emotion that integrates emotional geography with the organismic approach. The methodology chapter (Chapter 3) introduces the innovative interdisciplinary mixed methods approach that is adopted for this thesis. Not only does this chapter discuss the issues and challenges that arose when

[7] Forty-three people took part in the research but due some technical errors linked to the GPS the data from three participants have not been used in this thesis.

undertaking this research, but it also critically discusses each methodological instrument (interviews, biosensing etc.) in relation to research on emotion. In doing so, this chapter develops a way to put the biosocial ontology into practice through experimental interdisciplinary methodology.

Empirical Context - The theoretical and methodological background of the thesis is followed by a discussion of the empirical and case study contexts. The first of these chapters (Chapter 4) introduces the heritage conservation policy in Birmingham and the UK as well as the three case study areas of this research: Bournville, the Jewellery Quarter, and Moseley. This chapter explores how the commonalties and unique qualities of each area may influence the data collected and the themes that arose in this thesis. The subsequent chapter (Chapter 5) discusses previous research undertaken in the three areas that are the focus of the three empirical chapters: therapeutic landscapes, memory, and living heritage. Firstly, the chapter considers psychophysiological reactions to the physical environment and the therapeutic landscapes framework from Wilbert Gesler (1992, 1993) to the recent work of Völker & Kistemann (2011, 2013). Then turning the role of memory and nostalgia in people's connection to place and an area's community, this chapter looks how the processes of memory and emotion are interlinked socially but also biologically through the limbic system. Thus, demonstrating that memory epitomises a biosocial phenomenon. The final section looks at the notion of living heritage, as an area or site that is conserved but are still in process either as a result of the interplays between natural and social processes or because they are homes/places of work for the current population. To consider the complexities of these spaces, some of the theories that can be used to interpret them are introduced and discussed namely: cultural landscapes; the Freudian Uncanny; and a counter to commodification in the heritage industry and policy.

Empirics - Each of these empirical chapters is intended to fit into an empirical and theoretical narrative of the thesis, and thus enable me to develop the biosocial approach, both conceptually and methodologically. As such, each empirical chapter consists of a small theoretical discussion of the chapter's focus, primary data, and a discussion; whereby each chapter a specific cut (or sub-ecology) of urban conservation areas. Certain themes circulate and are represented from different angles in every chapter including the psychophysiological, embodiment, affect and feeling, (im)materialities, and space.

But more specifically, Chapter 6, takes the broadest cut on the heritage landscape and so sets the stage for the subsequent chapters. This chapter develops Völker and Kistemann's (2011) two-dimensional matrix of therapeutic spaces to discuss the various phenomena in the environment that have the capacity to evoke a psychophysiological response. By consolidating the two-dimensional matrix, the chapter discusses the evocative capacities of the physical environment on the senses, how social vitality can stir a feeling of place, and how the symbolic features (both material and immaterial) generate an emotional response. Crucially, however, I move beyond environmental psychology research by discussing the smaller features of an environment that influence psychological reactions rather than the spaces as a whole (i.e. green space). By taking this approach, the understanding of these spaces is stretched towards a geographical understanding of space as a network of human, non-human, and more-than-human flows.

Chapter 7 focuses on the experiences of space by looking at the emotional responses to their memories. Specifically, the chapter focuses on nostalgia, as a bittersweet emotional response to the past, to demonstrate the various ways in which nostalgia and the landscape are entangled at both a collective and individual level. The chapter shows that the processes of nostalgia can enrich an individual's connection with their immediate environment where the entanglement of the body and landscape establishes an emotional and memorial flow between imaginative bodies and the evocative landscape to enrich a person's sense of place and belonging with others who have had that experience. In comparison to the previous chapter, this chapter shows that personal individual connections with the landscape stir a stronger psychophysiological response.

Due to this stronger psychophysiological response that arises from an individual connection, the final empirical chapter (Chapter 8), which discusses the role of heritage directly, looking at some of the ways that heritage impacts upon the individual. The focus of this chapter, however, is heritage features that are situated between the nature/cultural binary in heritage classification. In doing so this chapter is able to consider the biological and socio-cultural processes that form features of urban heritage. By discussing a historical park and spaces of ruination/dereliction, this chapter problematises the prioritisation of cultural heritage within

heritage policy by demonstrating the care and value that is placed in the historical traces of human-nature interactions.

Conclusion – The final chapter draws the empirical strands together to return to the aims posed at the beginning of this thesis. It summarises the conclusions of the study by returning to each aim in turn and critically evaluates the use of a biosocial approach in relation to the three components of heritage environments with an emphasis on the strengths and weaknesses of biosensing technology in geographical scholarship. In doing so, it highlights this thesis' contribution to geographical scholarship and suggests future research agendas that could emerge from this research.

2

TOWARDS A BIOSOCIAL GEOGRAPHY

This study brings together social and biological understandings of the body to better understand the emotional processes in relation to urban heritage. This combination of geography and biology, however, is complicated by the reluctance from some social scientists to incorporate biological knowledges (and methods)[8] into their enquiries (Larregue & Rollins, In press; Tallis, 2011; van den Berghe, 1990). Geography, which is sometimes referred to as 'the magpie discipline' (Nayak & Jeffery, 2011), is often more accepting of new knowledges and methods compared to some of the other social sciences. Indeed, this chapter will show some of geography's attempts to incorporate biological knowledges and methods into the discipline. Even so, integrating biological insights into the discipline should be undertaken critically and with caution in order to avoid the controversies of positivism (cf. Haraway, 1988; G. Rose, 1993) and also the problems of misreading (whether wilfully or not) the methods and theories of the sciences (cf. Leys, 2011). As such, this chapter will introduce a biosocial geography through a critical discussion of biosocial research in the social sciences and how a biosocial geography fits within the discipline before focusing on emotions specifically. Thus, the following section discusses the ontology that is adopted in this thesis: '*2.1 The Biosocial Approach'*. This approach, which attempts to bridge biological and social worlds, has been used to great effect across the social sciences, but is yet to be put into practice in geographic research. And whilst there are some examples of geographers considering the biological and social, there is yet to be research

[8] Biosocial methodology is developed and discussed in the next chapter.

that develops and utilises these methods, data, and theories in tandem. The second section of this chapter, '*2.2 Biosocial Geography*', whilst focusing on the body, introduces the theoretical framing for this thesis. First it discusses some of the theoretical approaches used in geography that have attempted to incorporate biological knowledges and methods into the discipline, namely (Postmodern) Feminism, Non-Representation Theories, and Cognitive Geographies. Using visceral geography as the theoretical underpinning it, then develops a biosocial geography that considers the biological and social processes of the body and the relationships between them and the wider world. The following section focuses on the main crux of this research: emotion. In this section, the different ways of conceptualising and understanding emotion are introduced, including affectual theory and the organismic approach. As such, '*2.3 Biosocial Geography of Emotion*' discusses both the work of geographers and other disciplines including the cognitive sciences.[9] Crucially, however, it attempts to develop a new interdisciplinary biosocial approach to emotional research that bridges the work done by affectual theorists in geography and the organismic work undertaken in the natural and cognitive sciences.

2.1 THE BIOSOCIAL APPROACH

Until recently, biological knowledges and methods were of not popular in the social sciences because they were feared to be 'biologically deterministic' (Renwick, 2012). Indeed, it has been argued that the social sciences' "resistance to biological thinking is in large part trained incompetence, not simply garden-variety anthropocentrism. Many […] are not merely oblivious about biology and the cognitive sciences; they are militantly and proudly ignorant" (van den Berghe, 1990, p. 177). This apparent ignorance of biological insights is thankfully rarer today with social scientists becoming increasingly tolerant and sophisticated in their

[9] The 'cognitive sciences' is a collective term that encompasses disciplines that study the mind and its processes. The disciplines include psychology, psychophysiology, neuroscience, philosophy, and artificial intelligence among others.

studies into the relationships between people and the (social) world (Bone, 2016; Inglis et al., 2005; Robinson, 2004). As such, Meloni (2014, p. 3) suggests that there has been a 'biosocial turn' in the social sciences where "the two extreme wings of the nature/nurture dichotomy are equally destabilised by the new biosocial terrain". And although there may still be some reservations, more and more scholars are critically exploring the biological sciences' recent developments and their wider societal impact, as well as its potential influence upon their discipline (Callard & Fitzgerald, 2015; Franks, 2010; Pykett, 2018; S. J. Williams, 2010). And there are others, who are drawing upon knowledges and methods used in the biological sciences to advance their social science theorisations and analyses (Callard et al., 2015; Franks, 2010; Setchell et al., 2017). These studies show "how nuanced attention to *both* the biological sciences *and* the social sciences opens up novel perspectives on some of the most significant sociological, anthropological, philosophical, and biological questions of our era" (Meloni et al., 2018, p. 2 - original emphasis).

Simply, biosocial approaches seek to understand and examine human behaviour and social worlds by integrating knowledges and methods from the natural sciences, including biology, chemistry, neuroscience, and physiology among others. Thus, the biosocial approach recognises and affirms (both in theory and practice) that human behaviour and agency is a combination of biological and social processes, which can be examined at a variety of scales ranging from neurons and genetics to neighbourhoods and society more generally (Walsh, 2017; J. P. Wright & Boisvert, 2009). Within this ontology, humankind can be seen as ensembles of biosocial relations (Ingold & Pálsson, 2013; Pálsson, 2016). This approach to the self and the body challenges the reductionisms of cultural constructivism and sociobiology,[10] and interprets the body as "thoroughly relational … and endlessly refashioned in the habitus" (Pálsson, 2016, p. 111 - also see Pálsson, 2013). As such, it can be argued that humankind is a biosocial becoming:

> "Life unfolds as a tapestry of mutually conditioning relations may be summed up in a single word, social. All life, in this sense, is social.[11] Yet all life, too, is biological, in the sense that it entails processes of organic

[10] Examples of challenging these reductionisms include removing the pole of nurture into nature and vice versa (also see Higgins, 2018)

[11] This is similar to Latour's (2005) understanding of the social where the social is not a pre-existing category but is constantly being assembled and disassembled, and is not the sole property of humans.

> growth and decomposition, metabolism and respiration ... It follows that every trajectory of becoming issues forth within a field that is intrinsically social and biological, or in short, biosocial. ... This is why we speak of humans ... not as species beings but as biosocial becomings. ... The domains of *the social and the biological are one and the same*" (Ingold & Pálsson, 2013, p. 9 - emphasis added).

The biosocial approach thus considers the interaction of both biological and social forces and understands humankind as biological and social beings simultaneously. Consequently, the biosocial aligns with the notion that the self depends on both an agent's physical body and their social worlds and removes the ambiguity over the body's ontological status: "the body's organic persistence is concurrently an expression of lived sociality" (Higgins, 2018, p. 448).

Outside geography, entangled notions of the biosocial and the biocultural have emerged since the 1990s (see, for example, Aronson, 1995; Konner, 1991; Lock, 1993; Rabinow, 1996; Rabinow & Rose, 2006; Strathern, 1992). Since then, the biosocial approach has been adopted and discussed across disciplines from sociology (Fitzgerald & Callard, 2015; Meloni et al., 2016), education (Lindley & Youdell, 2016; Youdell, 2016, 2017), and the cognitive sciences (Connolly, 2002; Higgins, 2018) among others. Within childhood studies and criminology in particular, there has been an increasing number of scholars engaging with a biosocial approach to overcome the apparent biosocial dualism in the discipline.

Childhood Studies - In his discussion of the place of children and childhood in modern (western) society, Alan Prout (2005) suggests that the aspects of childhood, including memories, are reduced to either social or biological principle whereby "nature and culture remain … separate, incommensurable entities that are then seen as contributing a distinct proportion of the material that goes into making of childhood" (Prout, 2005, p. 3). Prout argues that this ontological politics of childhood has resulted in an historical trajectory that "zig-zags between the poles of the opposition, now placing childhood at the biological end, now at the social" (2005, pp. 43–44). Whilst childhood is (ontologically) an irreducible 'hybrid' (Prout, 2005) that is made up of biological, social, and technological networks, the biosocial dualism remains a pressing concern (Kraftl, 2013; Thorne, 2007). Recently, however, a number of scholars interested in childhood and children's studies have adopted

a biosocial approach, establishing a 'new wave' of childhood studies (Kraftl, 2013; Ryan, 2011). These studies, such as the work of Deborah Youdell (2016, 2017), seek to hybridise the biological and social aspects, explanations and theorisations of childhood looking at the neurobiological (Gagen, 2015; Pykett & Disney, 2016), physiological (Land, 2018; Land & Danis, 2016), and non-human (J. Horton & Kraftl, 2018; Pacini-Ketchabaw & Clark, 2016) influences upon children and childhoods.[12]

Criminology - Biosocial criminology has emerged to counter the "relatively little explanatory power" of traditional criminological theories and research, which see "social factors [as] the be-all and end-all when it comes to explaining crime and other forms of antisocial behaviour" (Beaver & Walsh, 2011, p. 3). It has been used and designed to integrate knowledge and methods across the biological and social sciences to develop comprehensive perspective to examine and discuss crime and criminals. Criminologists who have employed a biosocial approach have used biological methods and knowledges to investigate the relationship between biology (specifically genetics) and crime and anti-social behaviour (Beaver et al., 2015; Beaver & Walsh, 2011; Wright & Boisvert, 2009). It is important to note, however, that biosocial criminology is still considered a controversial approach that is treated with caution and often linked to positivism, biological determinism, and selective criminalisation (see, for example, Larregue & Rollins, In press).[13] Withstanding these arguments, the biosocial approach has been used to great effect in criminology, with an increasing number of scholars investigating, to great effect, the biosocial origins of antisocial behaviors including domestic violence (Soler et al., 2000), paedophilia (Feierman, 2012), and aggressive and violent behaviour (Stoff & Cairns, 2014) among others. Not only has biosocial criminology provided intellectual discovery, but has allowed criminologists to incorporate advanced methodologies, increased theoretical specificity, a renewed look at individual difference, and offers effective policy based on knowledge of human development (J. P. Wright & Boisvert, 2009). Biosocial criminology, therefore, is a fruitful approach in the study of crime and antisocial behaviours and has been used to great effect in criminology.

[12] I will return to this discussion on childhood in Chapter 7 in a discussion on nostalgic feelings about childhood.

[13] See Rutter's (2006) discussion of the critiques of biosocial criminology

The work being undertaken in childhood studies and criminology demonstrates the advantageous and compelling aspects of the biosocial approach that could be incorporated into geography. The theoretical and methodological developments in the biological sciences are increasingly more seductive to those in the social sciences because they often align with existing ideas within the social sciences. Looking at neuroscience specifically, for example, the philosopher Catherine Malabou has been using the neuroscientific notion of neuroplasticity to study trauma (2007), feminism (2009), and homelessness (Emmanielli & Malabou, 2009). Furthermore, sociologists and geographers are increasingly working with and speaking to neuroscientists in relation to their specialties (Fitzgerald, 2017; Pykett, 2018). It is important to stress, however, that the biosocial approach has been often been received with scepticism and mistrust because it is seen as the return to biological determinism, positivism, and placing the biological above the subjective and social aspects of being (Beaver et al., 2015; Tallis, 2011). Despite these claims, the biosocial approach seeks to abandon biophobia and provide a new foundation for the social sciences in understanding humankind. Within this exciting approach geography is in a unique position to consolidate upon the ways the biosocial approach has been used in childhood studies and criminology and develop a biosocial geography to study the interrelationships between people, place, and the environment that considers the biology body and the world simultaneously.

2.2 BIOSOCIAL GEOGRAPHY

Geography is a unique discipline that can be seen as a natural and social science as a result of its consideration of physical (biological, chemical, geophysical etc.) and human (economic, cultural, political etc.) geographies. The relations between physical and human geography have frequently prompted concern especially in relation to the ways the two approaches view the world: ‘object-world’ and ‘subject-world’ respectively (Giddens, 1982). Despite the division in the discipline, the consideration of both the human and

physical aspects of the world suggests that the adoption of a biosocial approach will not be a paradigm shift (especially since physical and human geographers have been collaborating more in recent years - e.g. Rangecroft et al., 2018) but rather a common-sense progression in the discipline's evolution. Indeed, Gregory et al. (2011, p. 288 - emphasis added) defines geography as "(the study of) the ways in which space is involved in the operation and outcome of *social* and *biophysical* processes". Since this a human geography study, however, the aim of this thesis is not to bridge the divide between human and physical geography but to consider and develop a means of incorporating human biology into the study of the interrelationships between people and space. As such, the thesis will focus on the processes and experiences of bodies thus allowing for the relationships between the biological, social, and environmental domains to be examined. In doing so, this biosocial geography will incorporate knowledges and ontologies in geography and biology to demonstrate what biological methodologies can bring to the discipline.

Biosocial beginnings in embodied geographies

Before developing this biosocial (embodied) geography, however, it is important to consider that many of the theoretical approaches that have influenced or been developed in geographical scholarship, especially in the field of embodied geography, have attempted to bridge the biological/social divide. For geographers, studies of the body or embodiment have encompassed the spatiality of bodies, the affective and performative aspects of being, and the interrelationship of body and place/space. These social and spatial conceptions and inquiries into the body can be collectively identified as embodied geographies (Cresswell, 1999; Dewsbury, 2003; Longhurst, 1997; Lorimer, 2005). As such, embodied geographies place a special emphasis on emotion, performance, affect, as well as the body in socio-cultural worlds which are typically grounded in phenomenological, feminist, and relational approaches (Bondi, 2005; Dewsbury, 2003; Longhurst, 1997; Lorimer, 2005; Paterson, 2009; Rodaway, 2002; Seamon, 1979; Tuan, 1976). And while these studies have (broadly) not directly engaged with biology directly – there still remains an opportunity to consolidate upon those theories that have influenced embodied geography. Thus, the following segments will introduce some key ontologies used in embodied geographies, discussing their understanding(s) of the body and embodiment, how they have attempted to consider the biosocial, and what aspects of the approach could enrich biosocial geographies.

I. (Postmodern) Feminism - Feminist scholars for a long period were (rightly) opposed to the biological sciences which positioned woman as a subordinate to men: "man is more courageous, pugnacious and energetic than woman, and has a more inventive genius [and] brain is absolutely larger" (Darwin, 2004 [1871], p. 622). The likes of Evelyn Fox Keller (1982), Moria Gattens (1988), Elizabeth Grosz (1990, 1994), Robyn Longhurst (1995, 1997) and Gillian Rose (1993) have heavily critiqued biological essentialism and determinism (especially regarding gender and sex) and the positioning of the body as 'Other' within geography. Consequently, the work of these feminist theorists "recognize[s] the reality of our fleshly nature, and examine[s] the possibilities and constraints that flow from it" (N. Rose, 2013, p. 4). There was (and remains) a growing consideration of the materialities, affects, and ontologies of bodies in recent postmodern feminist theory which no longer distances itself theoretically from biology and in some instances actively incorporates biology and the natural sciences.[14] In particular Karen Barad (2007, also see Kleinmann & Barad, 2012), Judith Butler (1993, 2002) Donna Haraway (1988, 1991, 1997), Victoria Pitts-Taylor (2010, 2016) and Elizabeth Wilson (1998, 2004, 2015)[15] have encouraged a collaboration between the social and natural sciences by urging "social scientists away from taking the natural sciences in general, and the biological sciences in particular, as mere objects or resources – as only practises that might be looked *at*, rather than *with*" (Meloni et al., 2018, p. 4). As such these feminist theorists have encouraged geographers, and social scientists in general, to think about "the body as process(es) rather than fixed … as existing in, and part of, a nexus of forces, moving through the world and co-creating it" (Birke, 2003, p. 46).

II. Non-Representational Theory – Non-Representational Theory (NRT)[16] originates from the work of Nigel Thrift in the late-1990s (see, for example, Thrift, 1996, 1997, 1999), but has had far wider application in the last twenty years with the work of Ben Anderson (2006, 2009, 2012), J.D. Dewsbury (2000, 2003, 2016), and Derek McCormack (2003, 2004, 2013) among others. NRT, in contrast to social constructivism, understands the lived world by

[14] See the discussion piece by Pedwell and Whitehead (2012) on the development of these approaches in feminist theory.

[15] It is important to note the majority of these scholars also adopt a new materialist approach in their research, which is discussed in the following section.

[16] NRT will also be discussed in section 2.3 in relation to emotion.

engaging with it as an ongoing and performative achievement (Dewsbury et al., 2002; Thrift, 2004). Thus, NRT focuses on the subtle and ineffable performances and practices that make up life to produce a geography of 'what happens' in the material and immaterial world (Thrift, 2008). Despite uncovering and acknowledging the importance of ineffable performance, NRT has been subject to a mixed reception in the discipline including being critiqued for encouraging an exclusive and de-politicised agenda (Sharp, 2009; Thien, 2005; Tolia-Kelly, 2006), embracing novelty to be original over academic gain (Castree & MacMillan, 2004), and not acknowledging or disregarding other theories (O. Jones, 2011; R. G. Smith, 2003).

Returning to the body, it is important to note that NRT does not privilege the human subject, but focuses on body's coevolution with the non-human, or more-than-human, and its consequential relatedness to the world (Thrift, 2008); or in other words "body and landscape are complementary terms: each implies the other, alternately as figure and ground" (Ingold, 2000a, p. 193). This focus on coevolution and relatedness results in a recognition of the importance of materialities, responsiveness, and rhythms of practice and these relate to embodied performance (including the sensorium and emotion). NRT's interpretation of the body, however, understands the body as constantly in process or becoming and thus, advocates a move away from the medicalised or socially constructed models of the body (Macpherson, 2010). For non-representational theorists, therefore, the body is not a network of flesh and bones but is considered in relation to biological impulses, habits, and reactions (Connolly, 2002; Lakoff & Johnson, 1999) that emerge from its 'interweavings' with the milieu (Damasio, 1999; Deleuze & Guattari, 1987). NRT, therefore, may be effective in understanding the body's relatedness to the world but places too much emphasis on unconscious experience. NRT understanding that cognition is an integrated functional process grounded in unconscious experiences of the body (Butcher, 2012) and thus, creates a boundary between the cognitive and the experiential which is untenable in the biological and cognitive sciences.

III. New Materialisms – Underpinned by the work of NRT theory and Actor Network-Theory (ANT)[17] the new materialist approach reconsiders the human in relation to other forms of life, matter, the environment, and all other forms of the non-human (Bennett et al., 2010; Haraway, 2013; Horton & Kraftl, 2018; Van der Tuin & Dolphijn, 2012). This understanding of humankind, which is often referred to as the posthuman (Braidotti, 2013), allows new materialists to initiate their studies from a conception of life itself (N. Rose, 2001, 2009), vitality (Bennett, 2009), or energetic flows (Barad, 2007) and remove the distinction between the human and their milieu by foregrounding the non-human. The posthuman informs much 'new materialist' work (Coole & Frost, 2010) which removes the special status of the human and positions the body in a network of non-human and more-than-human agents (Barad, 2007; Bennett, 2009). Furthermore, there are some new materialist scholars that have devised some biosocial ideas especially in relation to combining the cognitive sciences and the humanities. Catherine Malabou (2008, 2009), for example, has combined the neuroscientific discovery of plasticity with feminist theories of sex and gender.[18] It has been argued, however, that new materialistic literature is hindered by its anti-human position and has been argued to "ignore or misread the work of feminist and queer theory … and supresses the question and problem of difference" (Tompkins, 2016, n.p.) and offers very little in understanding the relations between mind and body, and human and non-human natures (Rekret, 2016). Although new materialism does provide a comprehensive approach to people in their milieu, much of this work moves away from incorporating biological understandings of the body and therefore has been argued to consider the body and its milieu solely in theory or poetics (Youdell & Lindley, 2018).

IV. The Neural Turn/Cognitive Geographies - While there is some history of engagement with the cognitive sciences in geography (Downs & Stea, 1973, 1977), in recent years there has been an increased interest in the cognitive sciences in geographical theory, especially in

[17] Actor-Network Theory originates from science and technology studies and through its decentring of the human subject, could be considered to represent an attempt to integrate the biological and sociological aspects of life. ANT decentres the human subject by viewing human action within a network of heterogeneous actors including technology and machines, animals and planets, and institutional structures (Latour, 1993; Law & Mol, 1995).

[18] Also see the work of Samantha Frost (2016), Victoria Pitts-Taylor (2010, 2016), and Elizabeth Wilson (1998, 2004, 2015), who have also used neuroscientific findings in relation to feminist and embodied theories.

relation to the body (Butcher, 2012; Fitzgerald & Callard, 2015; R. Jones, 2009; Pykett, 2015; Pykett & Disney, 2016). Cognitive geography has adopted knowledges from cognitive science to investigate the cognitive processes that led to spatial reasoning, behaviour, and information processing (Downs & Stea, 1977; Lobben, 2007; Lobben & Lawrence, 2014; Mark et al., 1999; Montello et al., 2003). Simply, cognitive geography is the study of cognition about space, place, and the environment that includes the processes of perception, learning, memory, attention, imagination, language, affect, and behaviour among others (Montello, 2009). There are four key tenets of cognitive science which form its epistemological and ontological assumptions (Montello, 2009):

1. Disaggregated level of analysis[19]
2. Behaviour is based on perceived or subjective analysis
3. Human-environment relations are dynamic and bidirectional
4. The mind emerges from the neural, in a body that is in a physical and social world.

Whilst cognitive geography matches with the main tenets of the cognitive sciences especially in regard to its positioning of the mind, the majority of cognitive geography inquiry concentrates on the production of geographic knowledge (Downs et al., 1988; Liben et al., 2013), navigation (Golledge, 1999; Lobben, 2007), and geospatial thinking and behaviour (Golledge, 1997; Lobben & Lawrence, 2014). Cognitive geography neglects the role that the body has in cognitive processes, despite positioning them in a body, to the extent that it could be argued that cognitive geography is the study of 'heads without bodies' (cf. Butcher, 2012). Even so, it demonstrates geography's willingness to engage in interdisciplinary work.

Clearly the embodied geographies literatures encompass a large (and often disparate) collection of epistemological positions, agendas, and methods. Yet despite the depth and breadth of embodied geographies, a limited concern for the 'biological' aspects of embodiment remains. Whilst all these examples may not explicitly incorporate both biological knowledges and methods into their discussions, each of them demonstrates a means of moving across disciplinary thresholds in geography. A biosocial geography, however, will develop upon (postmodern) feminism's emphasis on difference and multiple

[19] Disaggregated level of analysis simple means undertaking analysis at the level of the individual.

views, New Materialism's consideration of the body's connections with the wider world, NRT's attention to the ineffable relational flows between bodies, and the growing interest in neuroscience and the cognitive sciences in general.

Visceral geography

It has been shown how human geography has been (to some extent) moving towards a biosocial approach in its attempt to extend and question understandings of the body yet have a tendency to overlook the entanglement of biological and social processes. It is important to note, however, that there are some geographers that have attempted to combat this neglect of the biosocial through the development of a visceral geography (cf. Ash, 2017; Hayes-Conroy, 2009, 2017; Hayes-Conroy & Martin, 2010; Sexton et al., 2017). Visceral geography, defined as "the realm of internally-felt sensations, moods, and states of being, which are born from sensory engagement with the material world" (A. Hayes-Conroy & Hayes-Conroy, 2008, p. 462). Through its relational approach, visceral geography not only develops an understanding of the body that moves beyond Cartesian dualism but also establishes a framework to effectively investigate the senses and their effect(s) on the body and potentially "attend to broader biological and ecological realities … in the coming decades" (A. Hayes-Conroy, 2017, p. 52). For visceral geographers, therefore, the body is understood as an agent and allows the researcher to pay attention to the senses, as a mechanism for visceral arousal. Thus, visceral geography "is another way of thinking through the body, not just at the surface that is etched with social messages but something that encompasses surface and depth, outside and inside, solids and fluids, materiality and spirituality and head and heart" (Longhurst et al., 2009, p. 335).

Allison and Jessica Hayes-Conroy (2008) built on the work of Elspeth Probyn (2001) and Robyn Longhurst (et al.) (1995; 2008; 2009) to develop a visceral geography of food consumption. Hayes-Conroy and Hayes-Conroy's work on food studies and the body echoes that of a biosocial, even though even rarely uses the term because it explores "how bodies feel internally – sensations, moods, states of being – in relation with material social space" which "includes the biological and cognitive mind" (ibid. 2009, p. 2). The visceral approach, however, has typically focused on the consumption of food (see, for example, Bruckner, 2018; A. Hayes-Conroy, 2009; A. Hayes-Conroy & Martin, 2010; J. Hayes-Conroy &

Hayes-Conroy, 2013; Sexton, 2016; Waitt & Phillips, 2016)[20] and therefore there is an opportunity to move beyond food studies and apply visceral geography to a different subject, such as historical experience. After all, Hayes-Conroy and Hayes-Conroy (2008, p. 465 - emphasis added) did explain that:

> "*memory*, perception, cognitive thinking, *historical experience*, and other material relations and immaterial forces all intersect with individual's sensory grasp of the world, complicating one's visceral experience"

Even with this research opportunity, this thesis develops visceral geography (and aspects of the theoretical approaches detailed previously) further by not only incorporating methods from the biological sciences, but also knowledges from disciplines such as psychology, neuroscience, and biology to enhance geography's understanding of the body and its relationship with its milieu. Furthermore, this study expands the scope of visceral geography beyond the sensorium to consider the roles that the automatic nervous system has upon everyday experience through the use of biosensors.

Towards a biosocial geography

The biosocial geography approach that has been introduced in this thesis understands the body as a biosocial becoming (Ingold & Pálsson, 2013) which enfolds the social and the biological in the study of embodiment. It should be stressed, however, that whilst this biosocial geography focuses on the body and bodily experience(s), biosocial geographies are neither individualistic nor humanistic. Instead I propose that biosocial geographies should be relational in order to critically trace the associations beyond the body (where most geographical accounts end)[21] and into its complex internal processes and its milieu. In doing so, biosocial geography is able to consider various phenomena (such as heritage in this thesis) through a variety of processes: internal (biological), external (social), and beyond (spatial). Simply, biosocial geography takes biologically-inspired innovative ontologies and methods, and critically applies them to unearth new as well as evidence existing knowledges in geography on social worlds, the body-environment relationship, and embodiment. As

[20] A notable exception to visceral geography's focus on food is Sweet and Ortiz Escalante's (2015) work on women's fear of violence.

[21] With the obvious exception of visceral geography.

such, the development of biosocial geographies is exciting because it allows geography to study embodied phenomena that were previously overlooked or poorly understood and consolidate an exceptional history of embodied research in the discipline. It has been shown how the body's biosocial networks often omitted in geographical literature and the biosocial literature is yet to have a robust discussion into the importance of space, place, and the environment; as such, there is a clear opportunity here for biosocial geography: an interdisciplinary approach for investigating the body that incorporates the knowledges and methods of geography and the natural sciences.

Having developed the theoretical approach, the rest of this chapter will discuss the main focus of thesis; emotion. Our surroundings consist of much more than the physical environment: there are a series of material and immaterial flows and processes, many of which are experienced by and through the body. People inhabit, traverse and construct space, shaping it, as it, in turn, shapes them. Being in, and interacting with, space stirs a plethora of emotional psychophysiological reactions. The term psychophysiological is used here because the reactions that are discussed in this thesis arise from an intra-action[22] between conscious thought (psycho-) and the sensorimotor capacities of the body (physio-), both of which fuel the other.

2.3 BIOSOCIAL GEOGRAPHY OF EMOTION

Within the plethora of work in embodied geographies, emotions are a key feature. Indeed, for the vast majority of embodied literature, the emotional is either explicitly discussed or simply seen as by-/co-product of embodiment (see, for example, J. Davidson & Milligan, 2004; Longhurst, 1995, 1997). And whilst there are many conceptions of what emotions are, it is well documented that they are the most significant connection that we have with the

[22] Intra-action is used to signify "the mutual constitution of entangled agencies", where the body and landscape are not separate entities but "only distinct in relation to their mutual entanglement" (Barad, 2007, p. 33).

(social) world since emotions are bound to the highly personal aspects of being: embodiment, memory, and lived experience (Goldie, 2000; Johansen, 2015; Lupton, 1998). Psychological philosopher, Aron Ben-Ze'ev (2000, p. 11), for example, articulates emotions as:

> "something people think they recognise when they see them, yet it is difficult to define them unambiguously. Emotional complexity stems from the fact that emotions are highly sensitive to contextual and personal factors; emotions do not appear in isolation, but in a cluster of emotional attitudes; and the linguistic use of emotional terms is confusing."

As this quote suggests, emotions are personal phenomena that are experienced, shaped, and interpreted through the socio-cultural but arise from a series of biological processes. Regardless, there are many conceptions, interpretations, and applications across disciplines. Specifically, this section discusses geography's approaches to emotion following the emotional turn into affectual theory, and the organismic approach that is predominately used in the cognitive sciences.[23] This section then proposes a way to combine the various approaches to theorise the emotional response that can be inferred from the biosensing technology.

Geography, emotion, and affect

Approaches to emotions, as the introductory remarks suggest, may be conceptualised along a continuum which, broadly speaking, ranges from the '*organismic*' (biological or physiological) to '*social constructionist*' (socio-cultural), with '*interaction*' located somewhere between (Johansen, 2015; Simon J Williams, 2001). Typically, geography's engagement with emotion fits somewhere between social constructionism and interaction whereby feminist emotional geography investigates the socio-cultural aspects of emotion and affectual theory can be positioned within the interactional approach.[24] Regardless, geography's interest in emotion has a long history; for example, the humanistic geographers'

[23] The cognitive sciences do use other conceptions of emotion – see Oatley & Johnson-Laird (2014).

[24] It is important to note however that there are scholars whose research considers both interactional and feminist understandings of emotion such as Liz Bondi (2005, 2014). Also see Jo Sharp's (2009) discussion on feminism and emotional geography.

interest in the human connections with space (e.g. Tuan, 1976) and the call for the unrepresented aspects of life (including emotions) by feminist geography in the 1990s (G. Rose, 1993). In the beginning of the 21st Century, however, there was the emergence of an 'emotional geography' (Anderson & Smith, 2001) which led to the 'emotional turn' in the discipline (Davidson et al., 2012). Anderson and Smith's (2001) editorial paper calls for an understanding of emotions that are situated within, and co-constitutive of, our social lives (Pile, 2010). Simply, emotional geography is the study of the relations between emotions and space.

At the risk of oversimplifying, geography's current engagement with emotion is twofold. First, it responds to the understanding that emotions are a fuzzy but unavoidable aspect of life that infiltrates the socio-cultural, the political, and bodies and spaces (Ahmed, 2004a; Anderson & Smith, 2001; Davidson et al., 2012). And second, non-representational theorists who consider the ineffable and non-representational flows of (emotional) experience (McCormack, 2003; Thrift, 2008). These two approaches are not exclusive; indeed, both share a commitment to the associations of emotion in the body-space relations and phenomenological thought (Conradson, 2007; Paterson, 2007). However, both emotional geographers and affectual geographers assume that emotions are not contained by the mind and instead privilege the body. As such, 'emotional geography' is not just the study of emotions, but the effect that emotionality has upon body-space.

Anderson and Smith's (2001) editorial paper is often seen as the beginning of the 'emotional turn' in geography (see, for example, Bondi, 2005; Pile, 2010; Sharp, 2009). Anderson and Smith (2001), and Davidson et al. (2007) in the book entitled *Emotional Geographies*, developed an emotional geography that understood emotion (both experientially and conceptually) in terms of its social-spatial connection and mediation as opposed to solely interiorised mental states. Therefore, the intention of emotional geography is to investigate the "relational flows, fluxes, or currents in-between people and places" (Bondi et al., 2007, p. 3). Following Anderson and Smith's (2001) call for an emotional geography there was an increased interest in the spatialities of emotion. For instance, in 2002 there was the first International Symposium on Emotional Geography which received over eighty papers and a special issue in *Social and Cultural Geography* on emotion and space (J. Davidson & Milligan, 2004).

One of the key tenets of emotional geography is the ability to obtain "emotionally poignant and powerful" accounts during the research (Bondi et al., 2007, p. 3). Whilst this has allowed emotional geographers to better understand the spatiality and sociality of emotion, it does privilege subjective effable emotional experiences. In doing so, this privilege assumes honesty from the participants which, for some, is naïve and misguided (B. Anderson & Harrison, 2006; McCormack, 2006). As such, there are alternative accounts of emotion that emphasise the ineffable aspects of emotion that are beyond representation through non-representational theories (NRT) and the theory of affect. In NRT's area of emotional work, attention is paid to the emergence of emotions from assemblages[25] that combine the human, non-human, and more-than-human in broad fields of affect. This 'affectual geography' draws upon Deleuze (and Guattari's) (1988, 1997) readings of Spinoza's *Ethics* (1996) and Derrida's deconstruction of language to produce an understanding of emotion that is interpersonal and beyond cognition. Crucially, affect is ineffable and can evade representation. To quote Anderson (2006, p. 735) affect is "a transpersonal capacity which a body has to be affected (through an affection) and to affect (as the result of modifications)". The difference highlighted by Pile (2010) in his discussion of emotion and affect in geography, is that affect is not localisable in personal experience or expression, as emotions can be. Indeed McCormack (2003, p. 496) argues that "the creative potential of affect is arrested when one attempts to quantify or qualify its position as personal". Affect occurs "above, below and alongside the subject " (Protevi, 2009, p. 3), thus it influences a body's capacity before it is recognised in linguistic and subjective registers. In other words, affect is an unqualified, autonomous, and transitional 'force' between bodies, which cannot be owned or measured (Massumi, 2002; McCormack, 2003; Pile, 2010; Seigworth & Gregg, 2010; Shouse, 2005). Drawing upon this ontology, the recent writing on affect, especially within geography, has a very strong tendency to concentrate on the ineffable, non-subjective, and "aleatory dynamics of lived experience" (B. Anderson, 2012, p. 28).

[25] In the original texts, Deleuze and Guattari understand an assemblage as "larger than structure, system, form, process etc. An assemblage contains heterogeneous elements on a biological, social, machinic, gnoseological, or imaginary order" (Guattari, 2006 cited in Shaw, 2014, p. 88).

There is a danger, however, that legitimising virtual non-subjectivity fails to adequately consider socio-cultural and corporeal difference. This danger is demonstrated in the feminist critiques of affect theory (Thien, 2005, p. 452; Tolia-Kelly, 2006), where affect is argued to be "masculinist, technocratic and distancing" and re-establishes the dominance of the a universalised, depoliticised and affective (masculine) body. Additionally, affective theory's dependency on non-representation has proven problematic for Jacobs and Nash (2003, p. 275) who argue that non-representational geographies risk producing non-differentiated bodies which "are not figured through multiple categories of sex, ethnicity, race and dis/ability". Furthermore, NRT work (aside from moving away from biological understandings of the body) has a tendency to produce "very wordy worlds" (Crang, 2003, p. 501)[26] that overlook what these embodied experiences mean, how they differ between bodies and how they are happening within the internal networks of the body. Nonetheless, the relational approaches to emotion are able to move beyond the individual and see how social, spatial, and environmental factors influence emotions.

Organismic emotion and the affective sciences

In the biological sciences, however, there is a very different approach to emotions which places emphasis on the somatic: the organismic approach. For some of the most influential figures in western psychology who practice(d) the organismic approach, emotion derives from the visceral body (Darwin, 2009; A. Freud, 1992; S. Freud, 1991, 2003, James, 1884, 1890; S. J. Williams, 2001). Indeed, James (1884, p. 189) conceptualises emotions as "bodily changes [that] follow directly the perception of the exciting fact, and [...] our feeling of the same changes as they occur". Organismic theorists, as such, see biological as paramount to understanding emotion whereby the basic emotions (cf. Ekman, 1992) are understood to be relics of human's evolutionary past (Darwin, 2009), the expression of a 'dammed-up' libido (S. Freud, 1991),[27] and the conscious recognition and response to visceral (re)action (James, 1884). From these traditional organismic texts, it is apparent that

[26] It is important to note that Mike Crang (2003) is not referring to non-representational theories, but heavily qualitative research. Even so, the critique still applies since the majority of NRT work relies on qualitative fieldwork (Fox & Alldred, 2014).

[27] 'Dammed-up' is a Freudian (1991) metaphor that refers a manifestation of repressed instinct of the *id* (a part of the Freudian conception of the psyche that is responsible for bodily drives and impulses).

there is a strong emphasis on the animalism, the brain, and animalistic impulses but, perhaps, a disregard for the notions of subjectivity and the self.

The subsequent engagement with organismic theory has consolidated upon the work of Darwin, Freud, and James to look at the physiological foundations of emotion with an increased emphasis on the brain and the neural network. From many years of neurological testing and experiments (see, for example, MacKay et al., 1998, 2007), there is now increased knowledge of the role(s) that certain areas of the brain have in regard to emotion. The affective sciences, which continue this organismic approach (see Feldman-Barrett et al., 2007 for a review), pay attention to the physical aspects of emotion, feelings, mood, attitudes, affective styles, and temperament (Table 2.1). And as the definition of emotion in Table 2.1 implies, the affective sciences' understanding of emotion as an event derives from the fleshiness of bodies as people non-consciously respond to scenarios before cognition occurs (Levenson, 2014). Through this understanding of emotion, affective scientists have produced a variety of measures including self-reports (Benning & Ait Oumeziane, 2017; Nummenmaa et al., 2014), neuroimaging (Toga, 1996), affective computing (Picard, 1997; Tao & Tan, 2005) and biosensors (Kreibig, 2010; Sedenberg et al., 2018) among others. Through these methods the affective sciences have demonstrated the various autonomic nervous system (ANS)[28] activities, neurological activation(s), and physiological changes that occur during an emotional response (Colombetti, 2014). For example, Picard et al. (2001) and the Affective Computing Research Group (ACRG),[29] used four wearable skin-surface biosensors for several weeks and found that eight emotions (anger, grief, hatred, joy, neutral, platonic love, reverence, and romantic love) could be distinguished through the psychological response to an accuracy of 81%. Additionally, they found that the distinctions were not only limited to physiological response but also expressed valance. Expressed valance, as the subjective positive-to-negative evaluation of an experienced state, highlights the importance of combining corporeal and subjective responses in emotional and affectual research.

[28] The ANS is a largely unconscious control system responsible for regulating bodily functions including digestion, heart rate, respiration, urination and sexual arousal.

[29] The Affective Computing Research Group based at MIT is a group of scholars attempting to bridge the gap between computing and human emotion – see https://www.media.mit.edu/groups/affective-computing/overview/

Table 2.1: Definitions of targets of inquiry in the affective sciences (after R. J. Davidson, Scherer, & Goldsmith, 2003, p. xiii; Rottenberg & Gross, 2003, p. 227)

Target of inquiry	**Definition**
Emotion	A relatively brief episode of coordinated brain, autonomic, and behavioral changes that facilitate a response to an external or internal event of significance for the organism.
Feelings	The subjective representation of emotions.
Mood	A diffuse affective state that is often of lower intensity than emotion, but considerably longer in duration.
Attitudes	Relatively enduring, affectively coloured beliefs, preferences, and predispositions toward objects or persons.
Affective Styles	Relatively stable dispositions that bias an individual toward perceiving and responding to people and objects with a particular emotional quality, emotional dimension, or mood.
Temperament	Particular affective styles that are apparent early in life, and this may be determined by genetic factors.

Through these biological studies of emotion, affective scientists have been able to demonstrate that emotions are complicated embodied experiences, which include physiological changes, chemical release, and electrical impulses throughout the major organs, the neurological network (Figure 2.1), and the brain's limbic lobe.[30] The increasing number of discoveries and developments in methods in the affective sciences means that scholars in this field continue to show how close the biological links between emotion, the somatic and the neural are.

[30] The limbic lobe is primarily responsible to emotions, memory, olfaction, and stimulation and it will be discussed in in Chapter 4.

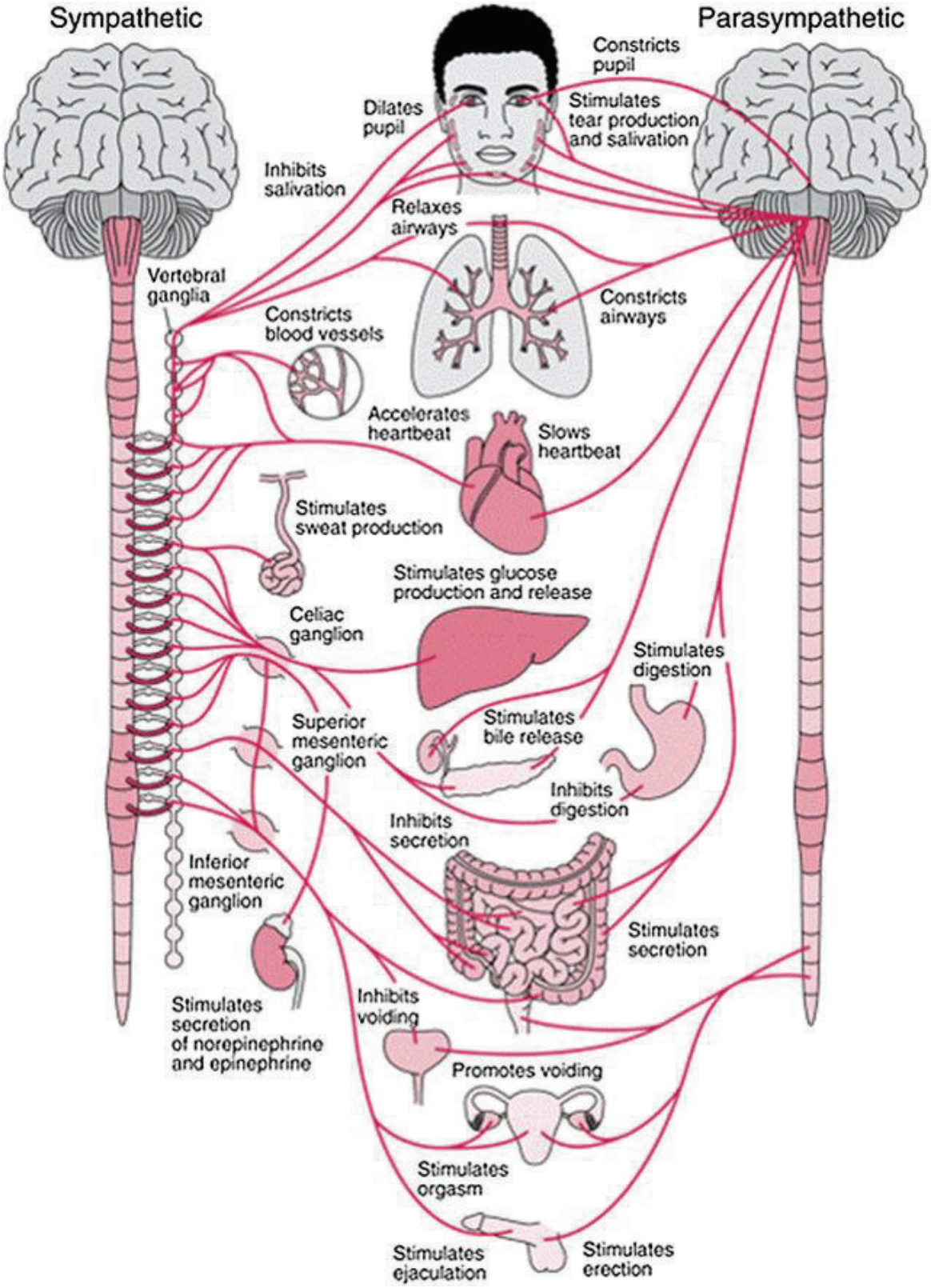


Figure 2.1: Anatomy of the autonomic nervous system and its sympathetic (fight-or-flight) and parasympathetic (rest-and-digest) branches (from Eckstein et al., 2017, p. 74).

Biosocial emotion: drawing together emotional strands

Hitherto this section has discussed two areas of emotional research (emotional geography and the organismic approach) which can be considered very different, or even opposing approaches to the study of emotion. For example, the organismic approach is asocial and assumes that all emotion is inherent and derives from inside the biological body. And whilst this approach may have led to many discoveries on the emotion networks of the body, it ignores the socio-cultural, relational and political aspects of emotion (Ahmed, 2004; Thien, 2005; Thrift, 2004). Indeed, Jackson (1993, p. 203) has argued that emotions do not have an "existence independent of the social and cultural context". Yet as I set out in this thesis, in foregrounding this context, there has been a consequent tendency within human geography to downplay the biological (even when it may enrich emotional geography) and as a result, the organismic approach may seem alien to emotional geographers. It is possible, however, to see where knowledge from the organismic approach to emotion could be placed in the diverse spread of emotional work in geography using Pile's (2010) layer-cake of emotion. Consolidating upon the work of Ben Anderson (2006), Pile controversially[31] produced a model of emotion and the mind-body (Figure 2.2), where the various forms of emotional response (affect, feelings, and emotion) have been positioned in the cognitive strata.

Emotional and affectual geographies respond to the non-cognitive and cognitive aspects of emotion, layers one and three respectively. This is not to say that the pre-cognitive aspects are disregarded, indeed there has been work on feelings (see, for example, Kraftl, 2013; G. Rose et al., 2010).[32] Instead this thesis applies aspects of the organismic approach to emotion to better understand "the heterogeneous flows of affect through bodies" (Pile, 2010, p. 9) using work undertaken in the affective sciences to investigate the internal processes of the body whilst also considering the non-cognitive and cognitive aspects of emotion: the *psychophysiology* of emotion. Psychophysiology considers the relationships between both the physical (physiological) and mental (psychology) embodied processes (Cacioppo et al.,

[31] There were many responses to Pile's paper disagreeing with various claims made from the layer-cake model to his understanding of Spinoza's affectus (see Bondi & Davidson, 2011; Curti et al., 2011; Dawney, 2011). Pile later responded to these critiques and argued that the critiques neither agreed with him or among themselves thus demonstrated that the theory of affect can be used in many ways (Pile, 2011).

[32] In the work of geographers more inspired by the work of ANT, 'feelings' are typically understood as emotions and are acknowledged rather than explored (Degen et al., 2008; Jacobs, 2006; Lees, 2001).

2000), and, as such, is able to consider the layers of the cognitive strata and consequently produces a rigourous and multifaceted understanding of emotion that considers the body, the (im)material, and subjectivity.

Layer One: the non-cognitive – affect is the deepest layer, below, behind and beyond both pre-cognition and cognition. As these are non-cognitive, they are non-psychological, in that they never become psychological objects. Affects reside in bodies, plural: they are not simply a bodily content or capacity, affect refers to flows (of affect) between bodies.
Layer Two: the pre-cognitive – feelings lie between affects and emotion, but they are not yet expressed or name-able, remaining tacit and intuitive. Nevertheless, feelings can emerge into consciousness. These are distinctly personal, as feelings are the emergent patterns that derive from heterogeneous flows of affect through bodies. Feelings are a response, therefore, to transpersonal affects and cannot be said, then, to be contiguous with the individual, even while they are personally experienced.
Layer Three: the cognitive – emotions are expressed feelings, being both conscious and experienced. Although emotions emerge from feelings, and represent personal experience, they are socially constructed, through language and other representational practices.

Figure 2.2: The mind-body layer-cake model (from Pile, 2010, p. 9)

It is important to note that psychophysiology is not a new approach for the cognitive sciences, who have been using it to further their understandings of the intersections between mental states and events and human biology (R. J. Davidson, 2003) and has been enhanced by methodological sophistication and advances in recent years (see, for example, Andreassi, 2010; Benning & Ait Oumeziane, 2017; Nummenmaa et al., 2014). In most of these studies, however, the data collection is restricted to a clinical setting despite the development of mobile methodologies in recent years. As a result, there is an opportunity for a methodological and ontological collaboration between psychophysiologists and geographers to consider the spatial and environmental phenomena that can stir a psychophysiological response in situ.

Furthermore, by considering emotional geography and the organismic approach to emotion in tandem, it addresses geography's minimal engagement with or knowledge of the

biological, neurological, or psychological factors that make up the subjects under investigation. This is not at the discredit of geography; I have explored above how the various theories of embodiment have enriched the discipline (cf. *Biosocial beginnings in embodied geographies*). Yet geography could progress further by incorporating biological knowledges and methods into its investigation, especially biosensing technology and increased knowledge of neurological processes, both of which are being used to great effect in other social science disciplines; namely sociology (Callard & Fitzgerald, 2015), education (Youdell & Lindley, 2018), and criminology (Beaver & Walsh, 2011). For example, the work of Rosalind Picard and the ACRG (Picard, 1997, 2003; Picard & Healey, 1997) have been developing and using biosensors to record and measure emotional responses at an 81% accuracy, whilst also recognising the importance of expressed valence and the effable aspects of experience. The use of biosensing (and the insights from the affective sciences) therefore can similarly fit well within existing geography research because it considers the importance of individual knowledges and opinions (cf. Feminism), unconscious embodied/somatic performance (cf. NRT), and how these experiences relate to milieu (cf. New Materialism). Thus, it is possible to investigate the relationship between the psychophysiology of emotion and a person's milieu. Indeed, biosensing technology and biodata has been argued to represent the "exteriority of experience and as evidence of the inhuman forces at play in any environment" (de Freitas, 2018, p. 294) and thus has the possibility to enrich geographical knowledge.

There is also the opportunity to integrate the geographical theorisation of emotion with that of the natural sciences. Even though NRT has often rejected the biological aspects of embodiment,[33] Deleuze (the key reference in NRT) shows in *Difference and Repetition* (1994) how conscious perception of an affectual flow originates from a field of tiny unconscious (micro-)perceptions. For Deleuze (1994, 1997) and Bergson (2002, 2004) conscious perception of the virtual is not a constant ability of an individual but grounded in sensorimotor processes of the body. Using this emphasis on the (biological) body, Protevi

[33] Exceptions include the work of Mark Paterson (Paterson, 2007, 2009) and Mark Protevi (2008, 2009, 2010, 2013).

(2009, 2010, 2013) integrates the theory of the 'embodied mind'[34] with Deleuzian thought to argue that affectivity is inescapably bound to embodied cognition: "affective cognition" therefore unites the rational, the emotional, and the affective. Affective cognition, however, is unescapably bound to the perceptive capacity of the body thus demonstrating that it is possible to combine geographical theoretical framings with cognitive science's domains of knowledge.

When combining geographical and biological ontological understandings of emotion, however, it could be argued that emotion is the conscious recognition of feeling. As opposed to feelings, the emotional display can be either genuine or contrived. This distinction between feelings and emotions where highlighted by an experiment conducted by Ekman (1972) who observed research subjects' emotional responses as they watched surgical films, first alone and then with others. Whilst watching the film alone, the participants demonstrated similar emotional expression; but when they watched with others, the expressions were heightened. Hence, emotion can be understood as an act in two senses: it can be an expression of genuine emotional arousal and it can be feigned as to fulfil social pressures and expectations. Thus, emotions are social forms of *performed* expression of perceptive capacity: both as an effable phenomenon (ascribing a word to a feeling, for example, happy) and/or as embodied performance (for example, facial expressions) both of which are bound to the socio-cultural.[35] Despite this, emotion should be understood as "the most intense expression of [affective] capture" (Massumi, 2002: 35), whilst also producing an escaped immaterial affect. After all, Prinz (2005, p. 17) did stress that "emotion can go unfelt", so not all affectual flows can be 'captured' and therefore brought into representation (cf. NRT). Even so, the use of physiological or neuroscientific measures provides the opportunity to measure and identify the *intensity* of affect through perceptive capacity, and thus, provide new branches of enquiry for affectual and emotional geographies.

[34] The 'embodied mind' approach is an unrestricted view of cognition which encompasses the brain, (the sensorimotor activity of) body, and the world (including the socio-cultural) as equal. Therefore, it is an approach in cognitive science that is structured by capacities of the body and the type(s) of environment it is situated in (A. Clark, 1997; Gallagher, 2006).

[35] This is an example of empathy; a meta-cognitive emotional state that is triggered by another (see M. L. Hoffman, 2008).

2.4 CONCLUSION: INTRODUCING A BIOSOCIAL GEOGRAPHY

This chapter has introduced a biosocial approach that will be implemented in this thesis to research emotion and heritage environments. The biosocial approach provides an opportunity for human geography to traverse the social/biological binary and establish an innovative space for investigation beyond dogmatic binaries. Challenging the biological/social dualism is not novel within the discipline. Indeed, in her review of 'Biosocial Becomings', Kim Ward (2014, n.p.) argues that "repeated critiques of [the biological and social] paradigm is now the established norm" in the social sciences. It has been shown that in the 1990s and 2000s, in particular (with the work of feminist scholars, NRT practitioners, and relational scholars) there has been a renewed attention on the "interaction between the social, the emotional, and the bodily physiology" (Newton, 2003, p. 35) which has "re-imagine[d] the relationship between cultural theory and science" (Papoulias & Callard, 2010, p. 29). Even so, the biological – the bones, muscles, nerves, blood, and hormones etc. – remains absent in the majority of geographical research aside from in theory. Indeed, as Williams et al (2003, p. 2) argue: "the biological has at best served as a foil for the sociological imagination, and at worst been dismissed or denounced altogether". Of course, there are good reasons for this distrust of the biological sciences; for example, biological evidence and justifications have been used to support inequalities based on sexuality, gender and ethnicity (see for example the work of Patricia Vertinsky (e.g. 1990, 1998) and Larregue & Rollin's commentary piece (In press)). Even so, a consideration and incorporation of the continuing biological discovered will enhance geographical scholars especially with the expanding interest in the internal processes of the body in geography (A. Hayes-Conroy & Hayes-Conroy, 2008; Kraftl, forthcoming; Sexton, 2016). Indeed, because while this thesis focuses on emotions, there is the opportunity for biosocial geographies to consider other internal bodily processes and systems, including ingestion.

But rather than simply incorporating biological knowledges and methods into geographical scholarship, biosocial geographies will be a relational endeavour considering the connections beyond the individual body but into the internal processes and its milieu (including the socio-cultural, political, and (im)material worlds). It is through this

consolidation upon existing geographical epistemologies (specifically NRT, New Materialisms, and ANT), I believe biosocial geographies can scrutinise and consider the biological processes of the body in the wider world. Put simply biosocial geographies is a study of embodiment which adopts biologically-inspired innovative theories and methods and applies them to unearth new and evidence existing knowledges in geography. This development of biosocial geographies is exciting because it allows geography to study embodied phenomena that were previously overlooked or poorly understood, consolidate upon an exceptional history of embodied research in the discipline, and bring a spatial element to the biosocial approach established outside of geography. The strengths of biosocial geography are especially apparent in the study of emotions where there is the opportunity to incorporate the new discoveries of the affective sciences to investigate the psychophysiology of emotion. And whilst the organismic approach and emotional geography may appear to be oppositional in their understanding and conception of emotion, it has been demonstrated how there are theoretical correlations (see Protevi, 2009, 2010, 2013) and many methodological opportunities. These methodological opportunities will be discussed in the following chapter which not only establishes a biosocial methodology for geographers but also outlines the specific methodology adopted in this study.

3

METHODOLOGY: PRACTICING BIOSOCIAL GEOGRAPHY

Having set the theoretical and epistemological groundings for this thesis, this chapter develops a methodological approach for doing biosocial geographies. In doing so, the chapter moves beyond Ingold and Palsson's (2013, p. 9) notion that "there is no division between" the biological and social because both disciplines have their own epistemologies and methodologies. Thus, to apply a biosocial approach it is important to understand the dynamics of interdisciplinary methodologies as well as how the various methods adopted can be integrated (Fitzgerald & Callard, 2015; Strang & McLeish, 2015). This chapter is an extended methodology because some of the methods are new and therefore need a detailed reflection and this thesis makes a significant methodological contribution. As such it has a detailed discussion on interdisciplinary mixed methods and the four main methods used in this research (biosensing, mobile video, video elicitation interviews, and (e)motional mapping[36]) before considering the research procedures for this study including recruitment, data collection, ethical and practical considerations, data processing, analyses, and presentation. In doing so, this chapter not only describes this research's methodology but also one of the first accounts of how a biosocial methodology can be developed as a novel and iterative process informed by both the natural and social sciences.

[36] The term (e)motional mapping is adopted from Perkins (2009) to describe mapping that considers both mobility and emotion.

3.1 INTERDISCIPLINARY MIXED METHODS

Mixed methods research is specifically used to describe hybrid applications in which two or more approaches are used concurrently (Creswell & Clark, 2011). It has been argued that if a mixed methods approach is poorly conceived or applied, it can be weak or lacking rigor (Teddlie & Tashakkori, 2003). It was therefore paramount that the mixed methods approach adopted in this study was carefully considered and developed. In addition to using quantitative and qualitative analyses in parallel (i.e. mixed methods research), this research also integrated different types of analyses and datasets to produce new understandings and interpretations especially between and beyond the biological and the social (i.e. interdisciplinary research). Research like this, that moves beyond the conventional academic boundaries, requires the receptivity and flexibility to transcend one's 'comfort zone' in order to recognise and understand the legitimacy and depth that "other" knowledges provide (Klein, 1990). Interdisciplinary research, consequently, requires a deep engagement with different, and sometimes unsettling, approaches to data collection, analysis, and writing. As such, considering and applying a biosocial approach, is challenging, time consuming, and is often hard to conduct, evaluate, write up and even publish than research in a single discipline (Charnley & Durham, 2010; Setchell et al., 2017; Strang & McLeish, 2015).

Looking at studies between the biological and social sciences specifically, it has been argued that most common form of interdisciplinary engagement is that of critique (Fitzgerald & Callard, 2015). Typically, critique is the comparison between the two disciplines to uncover the limitations of their theories and practice; for instance, the social sciences have been criticised for their lack of 'scientificity'[37] (T. S. D. Osborne & Rose, 1999) whereas the biological sciences have been deemed chauvinistic and adopt a 'God's-eye view' (Cromby, 2007; Haraway, 1991). Indeed, there is a mutual feeling of distrust and reluctance between the biological and social methodologies (Bayne, 2004; Schwanen, 2018; Tallis, 2011; K. Taylor, 2012). For example, it is argued within geography that "neurobiology naturalises

[37] 'Scientificity' is the extent to which a discipline is creative of new phenomena (T. S. D. Osborne & Rose, 1999).

the brain-mind relation" by hyperindividualising the mind and internalising behaviour, perception, memory, and emotion (Korf, 2008, p. 726). Not only do these neurosceptics claim that the incorporation of neuroscience could bring reductionism, biological essentialism, and individualism to the social sciences, but also that neuroscience leads to the 'aping of mankind' by rendering the human away from the 'self' and back to our pre-historical animal selves (Tallis, 2011). Yet with advances in neurological philosophies and methodologies, it is no longer possible to hide behind arguments of 'biological essentialism'; instead, there is a need for a biosocial science and the active incorporation of the biological into geographic scholarship (Pykett, 2015; N. Rose, 2013; E. Wilson, 1998; Youdell, 2016, 2017).

Whilst there are real collaborative opportunities between the social and biological sciences (as shown in the previous chapter), these opportunities are often hindered by the narrow discursive range of interdisciplinarity. The study, however, was undertaken by an individual, not a group of collaborating scholars from different disciplines. As such, I was able to avoid some of the typical issues that arise from collaborative work including a lack of appreciation for 'the other discipline' and defensive disciplinary stances (Callard et al., 2015; Cromby, 2007). Even so, interdisciplinary work is a difficult process that lead to multiple complications including linguistics, epistemologies, ontologies, and methodology. Fitzgerald and Callard (2015), however, call for methodological experimentation as an entry-point to the critical and conceptual space 'between' the social and biological. The methodological experimentation is a key aspect of interdisciplinary because it provides an ethos of openness (Morawski, 1988). As opposed to interdisciplinarity, the experimental approach to the biosocial of Fitzgerald and Callard (2015) starts in a middle ground where there are no boundaries between disciplines or ownership of specific objects of knowledge. This is a space where the different epistemologies and methodologies are mutually informing and iterative.

Considering these strengths of an interdisciplinary mixed methods approach, this study combines four distinct methods (discussed in the following section) that derived from both the biological and social sciences. In order to integrate the application and analyses of these methods a philosophy of *a methodology of dynamic reciprocal constraints* (Varela, 1996) needed to be adopted in order to acknowledge the limitations of each method and their

epistemologies. Varela's (1996) notion of a methodology of dynamic reciprocal constraints acknowledges that interdisciplinary mixed methods can be considered for both the potentials for 'triangulation' (confirmation and validation), but also for the "silences and incompatibilities that become evident when datasets produced by diverse methodologies are brought together" (Nightingale, 2003, p. 80). This is not to say that contradictory results are not valid; indeed, Nightingale's (2003) work on community forestry highlights that multiple interpretations can be simultaneously contradictory yet 'true' but also raise new questions and research areas.

In this study, for example, four multidisciplinary methods (biosensing, video, emotional mapping, and video elicitation interviews) were applied and analysed following the philosophy of *a methodology of dynamic reciprocal constraints*. As such, it was acknowledged that each individual method did not provide an empirical truth alone, yet the combination will provide a more robust understanding of the relationship between the body and the environment. It is important therefore to critically review each method, starting with biosensing, to demonstrate why a mixed methods approach is ideal. As such, the rest of this section will critically discuss previous research undertaken using biosensing, mobile video, (e)motional mapping, and video elicitation interview, highlighting the strengths and weaknesses of each approach; thus, justifying the interdisciplinary mixed methods approach adopted in this study.

Biosensing

As discussed in the previous chapter, the affective sciences have been developing and consolidating upon a collection of traditionally neuroscientific and/or medical methods to better understand the body's emotional networks. Biosensing technologies, as a collection of sensors that measure the body's automatic reactions to an experience, are an example of such a method which originally derives from neuroscience, psychology, and medicine. For more than forty years these disciplines have utilised biosensing technologies to treat various ailments and quantify human response to stimuli (Everly Jr. & Rosenfield, 1981; Schwartz & Andrasik, 2003). In the last twenty years, however, these biosensors have been developed to be smaller and cheaper (Neff & Nafus, 2016), and consequently are not limited to medical laboratories but are available to the general public. Whilst this process stimulated the 'quantified self' movement with commercialised biosensors (such as Fitbits) becoming

commonplace (Swan, 2013), it also provided an opportunity for non-medical disciplines to explore the possibilities these sensors could provide.

There are various forms of biosensors; each measure different aspects of the body. For instance, if someone wanted to measure their stress levels, they could use "wet" biosensors, such as cortisol levels in saliva, or "dry" biosensors, including electrodermal activity (EDA) and electroencephalographs (EEG) (Nafus, 2016). "Wet" biosensors are typically intrusive and involve handling bodily fluids; therefore, it can be difficult to undertake these measures outside of a laboratory setting and has additional ethical complications. "Dry" sensors, conversely, usually sit on the skin and are often mobile. As such, it is possible to use the sensors listed in Table 3.1 to measure the physiological reactions caused by the Automatic Nervous System (ANS). As discussed in the previous chapter, there are two major branches of the ANS: the parasympathetic nervous (PSNS) and the sympathetic nervous (SNS) systems, where the former generates the 'rest-and-digest' or 'feed-or-breed' responses and the latter is responsible for 'flight-or-fight'. In most cases, the systems have opposite actions whereby one system activates involuntary physiological responses and the other inhibits it. Furthermore, the ANS is controlled by the hypothalamus in the limbic system, an area of the brain that is responsible for several of the focuses in this research: emotional response (amygdala), memory (hippocampus), and smell (olfactory bulb) (S. Herz & Schooler, 2002; LeDoux, 2000; MacKay et al., 1998). Therefore, the modalities listed in Table 3.1 can be used to indicate the emotional reaction felt in response to the environment (Table 3.2).

Table 3.1: "Dry" biosensor modalities

Sensor	Modality	Unit
Electromyograph (EMG)	The electronic activity in the muscles	Microvolt (μV)
Electroencephalograph (EEG)	The frequency electronic activity in the brain	Hertz (Hz)
Thermistor	Skin temperature	Degree Celsius (°C)
Electrodermalgraph (EDG)	The electronic conductance on the skin	Microsiemens (μS)
Photoplethysmograph (PPG)	Blood flow	nanoWatt (nW)
Electrocardiogram (ECG)	The frequency electrical activity of the heart	Hertz (Hz)
Pneumograph	Respiration rate	Breaths/minute

Table 3.2: Emotional responses inferred from biosensing readings (after Kreibig, 2010; from T. Osborne, 2019, p. 71).[38]

	Anger	Anxiety	Disgust	Embarrassment	Fear	Sadness	Amusement	Contentment	Happiness	Joy	Pride	Relief	Surprise	Suspense
HR	↑	↑	↑	↑	↑	↑		↓	↑	↑	↓↑	↑	↑	↓
BVP	↓	↓	↑	↓	-	↓	↑	↓↑	↓	↑	-			
TEM	↓	↓	↓↑		↓	↓	-		↑				↓↑	
EDA	↑	↑	↑		↑	↓	↑	-				↓		

[38] Arrows indicate increased (↑), decreased (↓), or no change in activation from baseline (−), or both increases and decreases (↓↑).

Using EDA, heart rate (HR)/blood volume pulse (BVP) and skin temperature it is possible to infer the emotion experienced by the participant. Whilst the topic of ANS activation and its relation to emotion is disputed by contemporary psychologists (cf. Feldman-Barrett, 2006), many see ANS activity as a major component of the emotion response in many recent theories of emotion (see Calvo & D'Mello, 2010; Kreibig, 2012). Indeed, Sylvia Kreibig (2010) undertook a review of 134 publications that used peripheral ANS measures to investigate emotions. In her survey (which underpins Table 3.2) she demonstrates how 61 ANS measures can be used to identify different emotions and "serve as an instructive guide for future research" (Kreibig, 2010, p. 408). Although this study only investigates four ANS signals, they have been argued to be the most powerful emotion-related signals (Calvo & D'Mello, 2010; Peter & Herbon, 2006; Salazar-López et al., 2015). Even so, emotion is a very individual phenomenon that is dependent on the context or situation, as well as bodily and personality differences. And even for an individual, the intensity or response to an emotion can change day to day and across the life course (Bradley & Lang, 2000; Cacioppo et al., 2000; C. K. Lee et al., 2005). Yet despite these complexities of measuring emotion (especially using ANS activity), affective scientists continue to record emotions at high accuracies (e.g. Picard et al. (2001): 81% & Lee et al. (2005): 80.2%) suggesting that these measures can be used to identify and measure emotions and offer 'a window into the soul' (Sedenberg et al., 2018).

Table 3.2 attempts to simply demonstrate which emotions can be presumed to be experienced based on the biosensing measures. However, emotional experience is not as easily categorised as Table 3.2 would imply. Indeed, Picard (2003) has highlighted that emotions, and specifically the psychological responses, cannot fit into predetermined categories. As such, it is better to see these emotional categories as a guide, and subject to verbal confirmation using traditional qualitative methods. The use of biosensing technologies is common in health, psychology, and computer sciences. Yet, these engagements tend to be in the laboratory rather than exploring the opportunities offered by biosensing technologies in the real world. For example, Picard et al. (2001) used four sensors to identify the emotions experienced by their participants. Whilst they could identify eight individual emotions, these were the emotions predetermined by the researchers. Picard (2003) later highlighted that emotions, and specifically their psychological responses,

cannot fit into predetermined set categories; all bodies and how they respond to phenomena are different.

There is a limited amount of work that has used biosensing in a geographical context, yet a critical evaluation of these examples shows how biosensing technology can be applied in an effective way. Aspinall et al. (2013), for example, studied their participants' psychological responses whilst walking around Edinburgh, UK. Although this is a successful example of biosensing techniques outside of the laboratory, the presentation of data was limited - this research failed to provide a context for the variations within the data. It is evident from this that biodata cannot be unambiguously correlated with an emotion or the context, since emotions and responses are profoundly subjective (Resch, Summa et al., 2015). The Urban Emotions project attempted to 'ground truth' the biodata they collected using a smartphone application and volunteered geographical information (Resch, Sudmanns, et al., 2015; Zeile et al., 2015). The use of a smartphone application allowed their participants to input a short explanation for any variations in the biodata, such as 'traffic'. Whilst this project effectively contextualised the biosensing triggers, this contextualisation was limited to a single word rather than delving into rich personal narratives. Scholars who study emotion stress the importance of allowing participants to fully explain their feelings and past experiences when undertaking emotional research (Bondi, 2005).

On the other hand, the artist Christian Nold (2009) employed an initially similar process of biosensing using an GSR[39] sensor but combined it with other methods (predominately interviews). By combining the GSR with a GPS, maps were produced that illustrated the participant's intensity of feeling on a given route. Nold used these emotional maps as an elicitation tool as well as a final product, which allowed him to produce rich emotional narratives from his participants. Nold's work demonstrates that when biosensing methods are used alongside interviews or other qualitative methods, they can assist in the recollection of emotional perception of the environment. Similarly, Parker Ruskamp (2016) used a biosensing wristband and mobile video to investigate how different environmental characteristics affect stress-levels. Whilst this study was limited with the use of a

[39] GSR stands for Galvanic Skin Response and refers to sweat gland activity. It is a measure that falls under the umbrella term of EDA.

predetermined route, it is an example of a robust methodology that combined quantitative, visual, and qualitative methods. Using this methodology, Ruskamp (2016) could identify the relationship between the presence of street lighting and perceived safety and comfort; however, other factors including walkability, vegetation, and building heights did not. Ruskamp privileged the quantitative measures over the qualitative rather than using the various methods in a mutually supporting way. Simply, the qualitative and visual methods were solely used to contextualise the biodata rather than allowing the qualitative data to question the biodata and allow for analysis from multiple angles to allow for different connections.

These examples demonstrate that biosensing, as a method, when considered alone is severely limited. Whilst these technologies can measure physiological reactions and give an inclination as to what is happening within the brain, it is not clear how these physiological processes provide an insight into the biosocial or subjective experiences (Chalmers, 1996; Choudhury & Slaby, 2011; J. Levine, 1983), nor is there a consensus about the relationship between neurologically-inspired processes and cognitive, social, and emotional capacities captured in their full complexity (Gold & Stoljar, 1999). It is therefore apparent why the recent projects undertaken by Nold (2009), Ruskamp (2016) and (to some extent) Zeile et al. (2015), have used additional qualitative methods to explain and expand upon the results found by biosensing technologies. Yet, the mixed methods approach adopted by these scholars would benefit from iterative recursive processes – developed for the first time in this thesis – that involve multiple rounds of critical representation and analysis to form strengthened results that entertain rival explanations.

Mobile video ethnography

Mobile Video Ethnography (MVE) brings together mobile methods, ethnography, and video (Spinney, 2011). MVE employs video as a way of capturing the various details and contexts on the move whilst allowing the researcher to study the events 'as they happen' during playback with or without the participants (see, for example, Evers, 2015; Laurier, 2004, 2010; Spinney, 2011). In his discussion of the use of MVE, Spinney (2011) argues that MVE contributes to geographic inquiry by acting as a medium for seeing and feeling an event without physical presence: effectively capturing the fleeting and mobile, and, crucially, acting as "a tool to extend sensory vocabularies" (ibid. 2011, p. 163). Indeed, both Ruskamp

(2016) and Zeile et al. (2015) used mobile video to supplement and contextualise biosensing measures.

Digital video is particularly valuable for ethnographic research through its production of a rich and *continuous* collection and presentation of visual data (Geertz, 1996), as opposed to other forms of data such as photographs, texts, and aural media (Garrett, 2011b; Witmore, 2005). Thus, video methods are capable of recording the social world of the participant, "in flux and flow of passage and encounter on a sliding range of scale, time and place" (Garrett, 2011b, p. 522). The use of video, however, is often seen as suspect in the social sciences, especially within geography, where the (camera's) gaze has been theorised as the masculine and objectifying antithesis of work (Crang, 2003; G. Rose, 1993). Thus, it is not surprising that this association of 'the gaze' and vision within geography has led to a limited use of video within the discipline (Kindon, 2003). Ingold (2000b), on the other hand, suggests that this association between vision and distance appertains to the continued practice of adopting these preconceived ideas of vision as opposed to viewing it as productive and active. MacDougall (1997 in: Pink, 2006), for example, argues that video can be a useful tool to explore issues of the body, gender, identity, time, emotion, and the senses (Spinney, 2011).

In recent years, video has become increasingly utilised in the social sciences and geography (see Garrett, 2011b). Eric Laurier, for example, has used video to inform a variety of research including motorway driving (2004, 2010), his dog (2014) and the use of YouTube (2015). Additionally, video has been used as part of a participatory methodology by Parr (2007) and Kindon (2003) to explore the experience of mental health problems and theorise the feminist practice of looking, respectively (see also Pink, 2006).[40] These examples illustrate the way in which video can capture the banal yet fleeting aspects of life, which would be typically be missed or overlooked by traditional static texts. Indeed, video footage has been used to support, contextualise, or dispute the biodata by capturing the phenomena, gestures, sounds, and events experienced on the walk. Thus, the use of video here in this study is not an attempt "to capture the ephemeral, the fleeting" (G. Davies & Dwyer, 2007, p. 261) but form "a certain empirical utility" (Rye, 2003, p. 3).

[40] Other examples include Brown et al. (2008), Latham (2003), the various work of Sarah Pink (2001, 2006, 2007) and Justin Spinney (2007, 2009, 2011, 2015).

(E)motional mapping

In addition to the use of video, global information system (GIS) was used to create spatial visualisations of the biodata. GIS, as an umbrella term for technology which creates, manages, and analyses spatial data (Kwan, 2007; Longley, 2000), has allowed geographers to identify, represent, and analyse spatial trends. Whilst GIS is an effective tool for geographers, much has been written since the early 1990s about the limitations and social implications of GIS. These critiques have largely focused on issues of epistemology, representation, power, ethics, and privacy violation.[41] The effect of these critiques on GIS can be perfectly summarised by the term 'cartographic anxiety', which was first invoked by Derek Gregory (1994) in his critique of objectivist tradition in human geography. The term refers to the merging of reason and unreason or familiar and alien (cf. Bernstein's notion of Cartesian anxiety (1983, in: Gregory, 1994)). With reference to Olsson (1991) and Harley's (1992) works on 'deconstructing the map', Gregory (1994) argues that this anxiety arises from the uncertainty that occurs when maps' or geographical knowledge's authority is undermined. The notion of 'cartographic anxiety', therefore, produces a conflicted interpretation of maps - on the one hand, they are incredibly powerful devices for creating and presenting knowledge, but on the other they are hindered by the epistemological, representational, power, and ethical issues that are infused in map production and presentation. From this perspective, geographers should be anxious when working with GIS since maps are useful yet flawed. Therefore, it is important not to consider maps as a truth, but a product that is infused with epistemological, representational, power, and ethical dilemmas.

Even so, these criticisms of GIS have had a major impact on the practice and application of GIS in geographic research. Not only have they ensured that geographers reflect on their use of maps, but it has also integrated different knowledges into GIS. For example, there have been increased efforts to incorporate qualitative data within GIS (Knigge & Cope, 2006; Kwan & Knigge, 2006). The advances in GIS software have enabled researchers to embed audio, video, hand-drawn sketches, or photographs into maps as a way to represent non-

[41] Some examples include Curry (1994), Gregory (1994), Harley (1992), Krishna (1994), McLafferty (2005a, 2005b), Olsson (1991), Pickles (1995, 2004), and Sheppard (1993) among others.

cartographic forms of spatial knowledge (Al-Kodmany, 2002; Kwan, 2007). As such, a growing number of researchers have been using GIS-based spatial analyses with methodologies that are more familiar to qualitative researchers (such as ethnography, interviewing, or participatory action) (Dennis, 2006; P. Jones & Evans, 2012; Knigge & Cope, 2006; Kwan & Lee, 2004; Matthews et al., 2005; Pain et al., 2006). The combination of GIS with qualitative research, which is more commonly known as qualitative GIS, is capable of producing more robust findings through its incorporation forms of different knowledges (Kwan & Knigge, 2006).

In addition to the development to qualitative GIS, the increasing interest in emotion, affect, and the non-representational has had a major effect on GIS. In particular, the critical reflections of non-representational thinking has shifted our traditional understandings of maps, cartography, and GIS toward feminist notions of performance and performativity and away from simple representation (Crampton, 2009; V. J. Del Casino & Hanna, 2006; Kwan, 2007). For example, artists and cultural studies scholars have consolidated feminist notions to use GIS as a medium for self-expression (Boschmann & Cubbon, 2014; Lin, 2013; Parks, 2001). In recent years, technology has allowed even more (e)motion mapping to be enacted. Digital and satellite mapping technologies supporting networking, portable location-aware computing devices allow user led mapping, social networking, and artistic interventions to be enacted on the canvas of the real world. People can track themselves, across the landscape for a variety of artistic or playful ways, including tracklog artistry or writing (Jones, 2014; Lund, 2017; T. Osborne et al., 2019). Others deploy different technologies and methods to chart changing feelings in space including social media data (Quercia et al., 2015; Resch, Sudmanns, et al., 2015; Sui & Goodchild, 2011), photographs (Orsi & Geneletti, 2013), data from smartphone applications (Resch, Summa, et al., 2015; Stals et al., 2018) and biosensing equipment (National Geographic, 2017; Nold, 2009; Zeile et al., 2015). The maps produced by these scholars through the combination of biosensing technology (Figure 3.1), not only represent the (e)motional but can also "act as a performative technology [by] assisting recollection and the study of quiescence in everyday mobility by offering up bodily traces to be reflected upon" (Spinney, 2015, p. 240) with the use of qualitative methods and mixed methods analyses.[42]

[42] Mixed methods GIS analyses will be discussed later in the chapter.

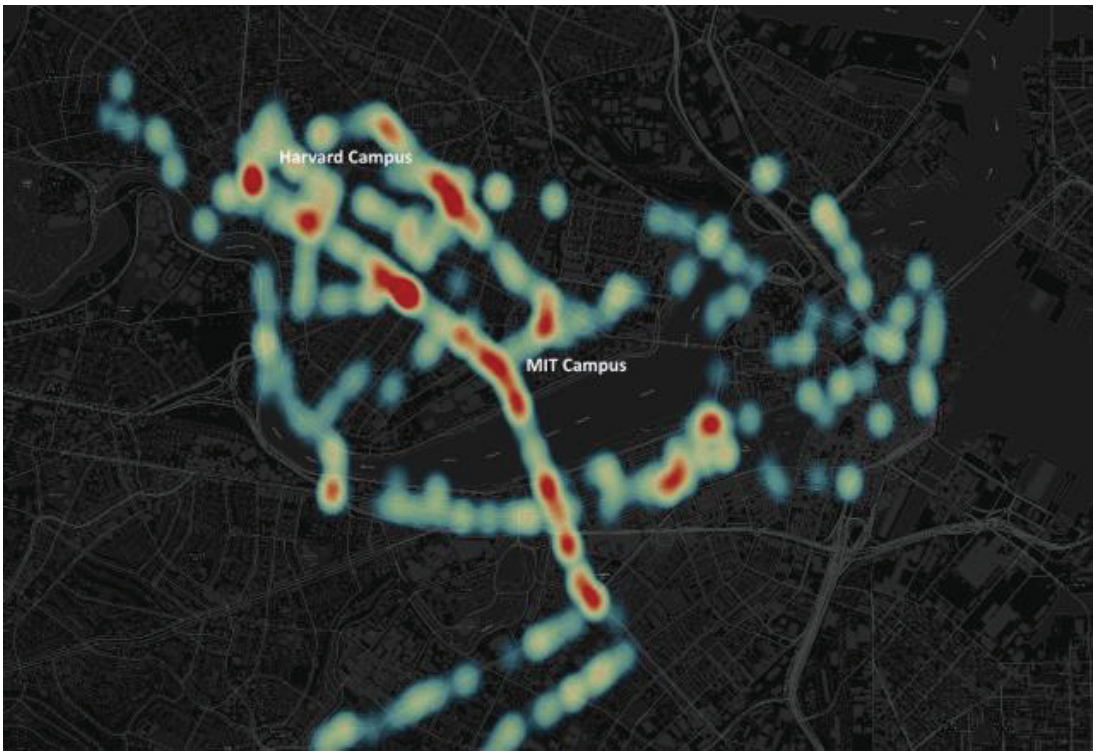


Figure 3.1: Urban Emotion Map – Cyclists' Emotions in Boston, USA (from ZGIS, 2016, n.p.).

Video elicitation interviews

Interviews, as a discussion between researcher and researched on a given topic, allows the researcher access to the participant's interpretations and experiences of a phenomena. It is the close interactions in interviews which provide detailed subjective understanding of the phenomena in question (Dey, 1993), and they therefore form an effective tool for investigating memory and emotion. The practice of semi-structured in-depth interviews, where the researcher asks open-ended questions to the participant, is often used to gain emotional and memorial testimony due to its flexibility (Reinharz & Davidman, 1992).[43] The semi-structured element of this approach affords the participant the flexibility to explore topics and issues they consider to be significant, whilst maintaining a simple structure keeps the interviews controllable and on topic (Laurier & Parr, 2000; Longhurst, 2010; Reinharz & Davidman, 1992).

[43] Semi-structured can refer to many forms of interview, but here it refers to having a set of questions ready in case the conversation dries up (Valentine, 2005).

Elicitation interviews, as a variation on the traditional interviews, uses a stimulus, such as photographs (Clark-Ibanez, 2004; C. D. Clark, 1999), video (Spinney, 2009), maps (Nold, 2009), or written records (Bolger et al., 2003), to encourage the participants into a highly-detailed discussion on a particular subject. Video elicitation techniques are now a common method adopted in the social sciences, especially in education,[44] yet are still not overly utilised in geography (Dempsey, 2010; Nguyen et al., 2013). Even so, variations of video elicitation interviews, such as video narratives (Pink, 2004), have been used in cognitive science (Crandall et al., 2006), anthropology (Nastasi, 1999), and other social science disciplines (Rosenstein, 2002).

Video elicitation interviews not only produce a vast quantity of data, but also facilitate the investigation of fluctuations in participants' feelings and thoughts within a single interaction. For example, the findings from previous research using video elicitation interviews suggest that the elicitation process facilitates three kinds of experience for interview participants (Henry & Fetters, 2012; N. T. Nguyen et al., 2013; Pomerantz, 2005): recollection, reliving, and reflection. Firstly, the participants remember the thoughts and emotions experiences they experienced; secondly, the participants can frequently re-experience to the extent that they even display emotional or physiologic changes in response to the footage (Pink, 2006; Pink et al., 2017), and; finally the participants often reflect upon their thoughts and actions. The issue here, however, is that the researcher may have difficulty distinguishing between recollection, reliving, or reflection (Pomerantz, 2005). Additionally, the participants' comments do not always reflect their actual emotions or thoughts during the event; instead they may misremember (or misconstruct) them based on the video footage or to please the researcher (Lyle, 2010). Nevertheless, the biosensing equipment measures the involuntary (para)sympathetic reactions, which are very hard to feign. Therefore, the two methods combined should provide a robust biosocial account of the relationship between the body and the urban environment.

Doing biosocial geography: an integrated methodology

Through the discussion on biosensing, mobile video, (e)motional mapping, and video elicitation interviews the various strengths and weaknesses on the methods have been

[44] In education, elicitation interviews are referred to as 'stimulated recall'.

demonstrated using examples within and outside of geography. These examples, even though they focus on one specific method, each use different methods to support and mutually inform their findings: for example, the use of visual objects in the video elicitation interviews. As it will be detailed in the following section, this study combined these four methods to uncover and combine the spatial, psychological, effable, and visual aspects of experience. In doing so, this study develops a methodology that adopts different epistemologies and methods that are mutually informing and iterative to develop an innovative biosocial methodology. It is important to stress that the development of biosocial research tools and methods are already underway in disciplines such as sociology and education (de Freitas, 2018; Meloni et al., 2016; Youdell & Lindley, 2018), but this is one of the few examples of biosocial research being undertaken in geography. As such, this study moves beyond interdisciplinary critique and through creative methodological experimentation (cf. Fitzgerald & Callard, 2015) develops a new approach: biosocial geography. The rest of this chapter will therefore discuss, in detail, the specific research process in this study (Figure 3.2) which consolidates and develops this new epistemology in geography.

3.2 RESEARCH PROCESS

The mixed methods design for this research was undertaken in six stages: (i) ethical review, (ii) recruitment, (iii) data collection, (iv) data processing and collation, (v) independent analysis, and (vi) combined analysis, which is represented in Figure 3.2: a flowchart of the research process, demonstrating the complexity of undertaking a mixed method approach with an experimental methodology. The recruitment and data collection processes (stages I-III) were carried out over a period of five months from August to December 2016. The forty-three participants, who either lived or worked in the case study areas (discussed in detail in Chapter 5), first undertook an unaccompanied walk around the area wearing a biosensing wristband and a chest mounted GoPro camera whilst carrying a global positioning system (GPS). Immediately after, the participants undertook a semi-structured elicitation interview

using the footage from their walk that concentrated on their choice of route, feelings, experiences, memories, and the surrounding environment. The data processing and analysis (stages IV-VI), on the other hand, was carried out over a period eight months from August 2016 to March 2017. With the sheer amount of data produced, there were two stages of data analysis: independent and combined. During the independent analysis stage, the spatialised and temporalised biodata was converted into visual products (charts and maps) to manually identify points of fluctuation (such as spikes, troughs, or general trends), and the transcripts were coded. To produce robust mixed methods analyses, however, it was important that combined analyses were undertaken. During this stage, three approaches were utilised: environment-, thematic-, and biosensing-led, and underpinned by a grounded visualisation approach (Knigge & Cope, 2006). In this approach to analysis, the key topics discussed by the participants are compared to the spatial-, film-, and bio-datasets. Using the identified points of fluctuation in the biodata as a base, for example, the biosensing-led approach used the transcripts, biosensing maps, and the films to contextualise and provide the *reciprocal constraints*: the expressed valance that may match the physiological arousal. These three analytical approaches uncover different knowledges which are reflected in the three empirical chapters whereby Chapters 6, 7, and 8 are guided, but not exclusively, by environment- and visual-led, thematic-led, and biosensing-led approaches respectively.

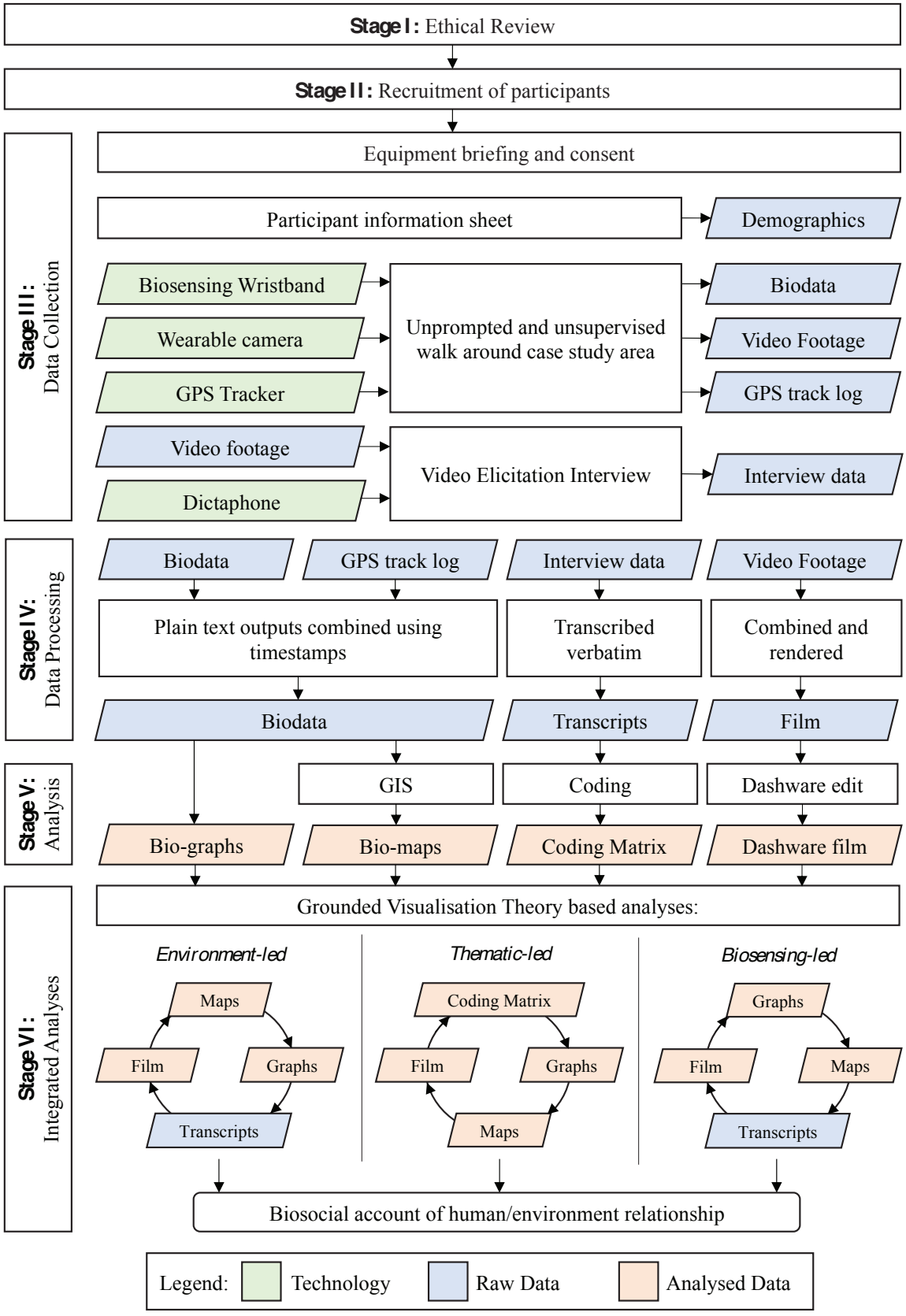


Figure 3.2: Flowchart of research process

I. Ethical considerations

Before the research process (detailed in Figure 3.2) could be initiated, an ethical review needed to be undertaken. Both the University of Birmingham and the Economic and Social Research Council (ESRC, the funding body for this research) require that all research projects undergo an ethical review to ensuring that both institution's ethical principles are guaranteed throughout the research process (ESRC, 2016; University of Birmingham, 2016). Of particular interest in this review was the use of biosensing and mobile video in relation to the participant's subjectivity and health.

Whilst the use of biosensing can gain an insight into individual level psychophysiological responses, it reduces the body to a series of numbers and there is a consequential risk that the participant's body could be viewed as a 'complex information network' (Lupton, 2012), therefore removing the subjectivity of the individual. However, this study is not a solely quantitative piece of work, it considers the rich personal narratives of each participant to gain a deep understanding of the body-*subject*. Furthermore, all participants voluntarily participated through an opt-in agreement, undergoing a thorough instruction phase and were in the knowledge that their physiological data was to be collected, analysed, and shared with them. It was possible that the biodata would highlight a health issue suffered by the participant. As such, it was paramount to be completely transparent with the participants; the individual's biodata was shared with them and it was stressed that the researcher was not a medical professional, and information was provided to explain where they could find further information if they had any concerns. To limit the impact that a pre-existing medical condition could have on the data collected, all the participants were asked whether they had either a heart or skin condition, which could affect the BVP/HR and EDA respectively. This data was recorded in confidence, but also allowed the researcher to stress that a pre-existing medical condition would affect the participant's data, and that it was not necessarily a cause for concern. Consequently, additional precautions needed to be present to maintain the confidentially of the participant. All the biodata was stored confidentially (each participant was given a code) in a secure and independent server, making the data only accessible to the researcher.

The use of mobile video was highlighted as an ethical issue by Legal Services (University of Birmingham), who follow the guidelines developed by the Information Commissioner's

Office (ICO, 2017) and concerned with the "sensitivity of the footage" and the need for encryption in case the device was lost and feature 'sensitive' footage. These guidelines, however, refer to the use of body-worn cameras by police officers, who are more likely to be exposed to 'sensitive' situations. Because the footage captured by the camera in this project was of everyday street scenes, the likelihood of capturing any 'sensitive' activities was very low. In addition, a 'sensitive' event being captured and the camera subsequently stolen was even more unlikely and therefore a low risk.

Whilst the use of filming equipment in public spaces is legal, it has been argued that individuals have the right to privacy in both private and public spaces (Silverman, 2001; Wang & Redwood-Jones, 2001); however, it is impossible operate an opt-in system and gain written consent from all the people who are caught by the film. As with previous work funded by the ESRC (Laurier & Philo, 2006; Simpson, 2010), the filming in this research was undertaken overtly and all participants carried an information sheet to provide information about the research, how confidentially will be addressed, and the researcher's contact details in case of queries from passers-by. It is important to note, however, that participants saw the raw footage (i.e. without pixelated faces) during their elicitation interview and any pixilation occurred after the data collection period when the video or stills of the video were used in presentations, papers, or this thesis.

A significant part of the review process for this project is to obtain informed consent from all the participants regarding their participation. As such, an Information and Consent Form was developed and shared with the participants, to be signed to confirm their informed consent to take part.[45] This provided written informed consent from all who took part, while the participants had the necessary information regarding the project (along with my, and my lead supervisor's contact details if they had any further questions or issues). Furthermore, it was crucial to ensure participant confidentiality, not least when the participants were providing personal biodata. As such, all data linked to an individual participant used a participant code instead of their names to prevent identification and all of the physiological data was processed and collated by the researcher to ensure that the data was secure.

[45] A copy of the Information and Consent Form can be found in the Appendix 3.

II. Recruitment & sampling

Following the ethical review, a total of forty-three participants were recruited to undertake the research process; twenty in Bournville, eleven in the Jewellery Quarter, and twelve in Moseley.[46] All these people either lived or worked in the area and volunteered to take part in the research. This method of sampling may not be representative of the whole population, in that people who are likely to volunteer tend to be distinct from those who do not (O'Leary, 2004).[47] However, this form of non-random sampling is highly convenient, as those who volunteer are more likely to have an emotional connection to their area (Morse, 1991; Shaheen & Pradhan, 2019); therefore such non-random sampling was best suited for this research.

Within mixed methods research, it is often hard to determine an appropriate sample size because of the differences between qualitative and quantitative approaches. Qualitative studies typically focus on in-depth analysis in small samples, whereas quantitative studies use large-sized samples (Dreher, 1994; O'Leary, 2004). In mixed methods research, a balance must be struck between the two methodological approaches: large enough to be representative of the population, yet small enough to make the datasets manageable, and still reflect the scope of the research questions (Teddlie & Yu, 2007). The personal focus of the research on emotion, memory, and the sheer amount of data produced through biosensing meant that a target sample size of ten people in each area was suitable. This target, however, was surpassed in every area and is reflected in variations in recruitment between the areas.

Many forms of recruitment were adopted, contacting gatekeepers (including individuals, forums, and societies) as well as posting information and messages on social media pages. Firstly, using urban heritage as a focus for recruitment,[48] I contacted community groups of the three areas were contacted, including the Moseley Society, the Bournville Society, and the Jewellery Quarter Development Trust (JQDT), along with the administrators of several community social media pages and groups, most notably:

[46] The case study areas will be introduced in Chapter 5 (p.101).

[47] Often, those who volunteer to participate have a strong interest in the project or its themes (O'Leary, 2004). In this project, for example, most of the participants either had an interest in heritage, wearable technology, or artistic practices of walking.

[48] The focus on urban heritage is discussed thoroughly in the next chapter.

- Bournville News (https://www.facebook.com/bournvillenews/)
- Jewellery Quarter (https://www.facebook.com/jqdtbirmingham/)
- Everything Moseley (https://www.facebook.com/groups/1700746473482578/)

On these pages, an advertisement was posted to promote the research and actively seek volunteers. This process was very successful in both Moseley and Bournville; indeed, the clear majority of participants in Moseley were recruited through this means. Whilst it is important to recognise that access to the internet is not uniform across demographics (Luh Sin, 2015), the sheer amount of daily social media use means that it has become a valuable tool in research recruitment. Indeed, Crang (2011, p. 402) has argued that "a great deal of our social world is now enabled by, mediated by, invested in and bound to various communication technologies".

Figure 3.3: Screengrab of recruitment advertisement on BVT website

Additionally, the promotional materials were forwarded on to new and (sometimes) more expansive audiences. Firstly, the Bournville Village Trust (BVT)[49] became aware of the research and sought to promote it further. The Trust placed an advert on their website (Figure 3.3) as well as their quarterly magazine, which was delivered to every household in the BVT area. The response from these advertisements was very positive and is reflected in Bournville having double the number of participants compared to the two other areas. I was also given the contact details of a freelance community engagement professional, who as well-known figure in the Jewellery Quarter, and able to use their list of contacts and Twitter accounts to advertise the research. It has been argued that the use of gatekeepers in research can limit the access to participants and the data produced (Broadhead & Rist, 1976; Feldman et al., 2003; McFadyen & Rankin, 2016); however, the use of gatekeepers in the research was limited and therefore did not restrict the participants available or the data produced.

Whilst the use of a volunteer sample can be considered biased since only people with an interest in the research will volunteer, it was very effective in finding more than enough participants for this project and all the participants were happy and willing to take part. In total, forty-three participants took part in this research; however, only forty could be used in this PhD because of technological constraints (discussed later in this chapter). All participants were adults who either lived or worked in Bournville, the Jewellery Quarter, or Moseley, and since they were from a volunteered sample, all the participants had an interest in and a knowledge of their areas. The participant demographics were reflective of the respective areas (discussed in detail in Chapter 5); the Jewellery Quarter has a younger population compared to Bournville and Moseley.[50] Additionally, the gender split was approximately equal, at twenty men to twenty-three women.

In addition to their age, the participants were also asked how long they had lived or worked in the given area. Figures 3.4 and 3.5, showing the results of this aspect of the question sheet, demonstrates how the Jewellery Quarter has a less established population compared to Bournville and Moseley. Typically, the population in the Jewellery Quarter is transient: so

[49] The BVT is a housing association founded by George Cadbury to maintain and preserve the Bournville Estate as envisioned by Cadbury and will be discussed in detail in Chapter 5.

[50] The average age in the Jewellery Quarter, Moseley, and Bournville are 31, 37, and 39 respectively (ONS, 2011).

much that a participant defined the area as "an ever-changing community" (Interview with Karen, 17/08/16) which is reflected in the sample taken. In Moseley, on the other hand, the population moved to the area during the late 20th Century during the height of its regeneration, when bohemians, students, and artists moved into the area (Fairn, 2004). Whilst some were priced out by the affluence of the area, many have remained in the area to the present day. Finally, most people in Bournville have (often historic) family ties to the Cadbury Factory. Indeed, many of the participants were proud of the number of generations of their family that had lived in the area.

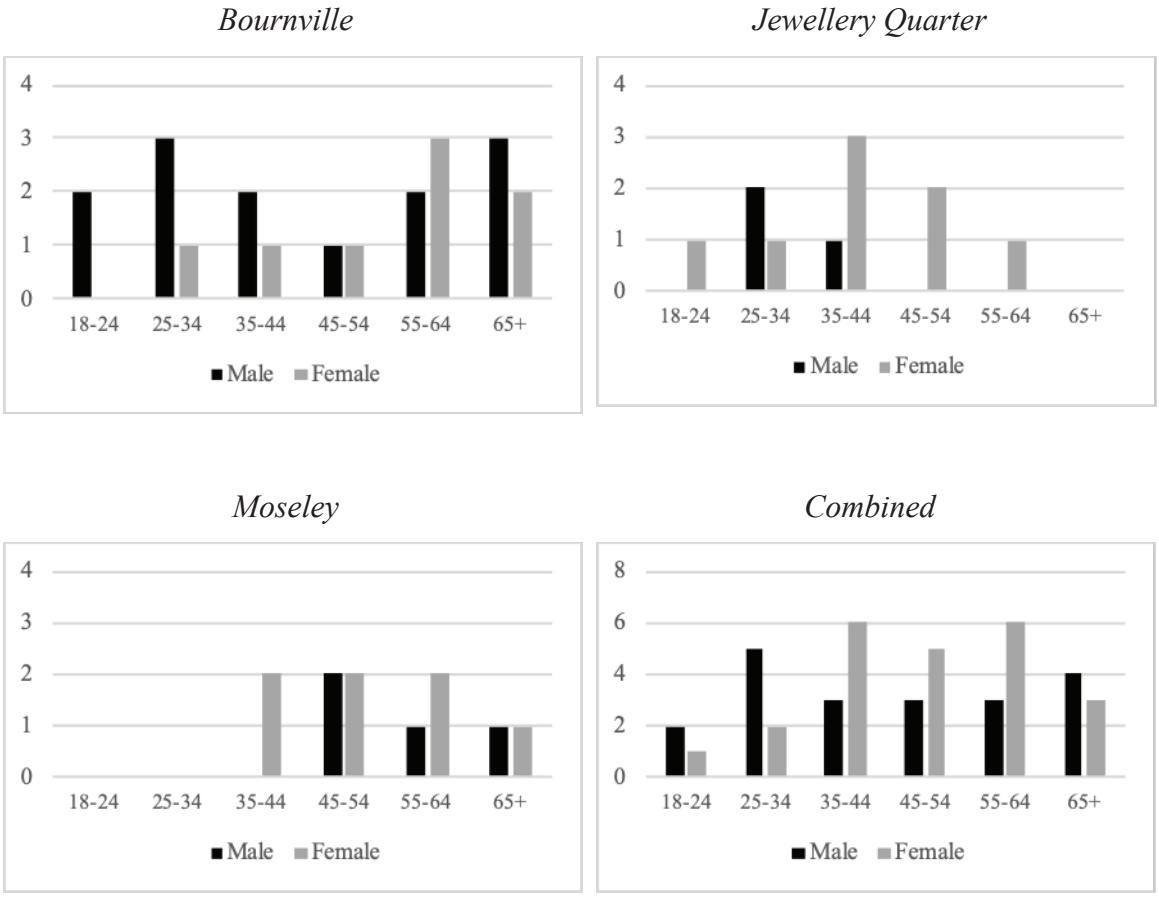


Figure 3.4: Age and gender distribution of participants

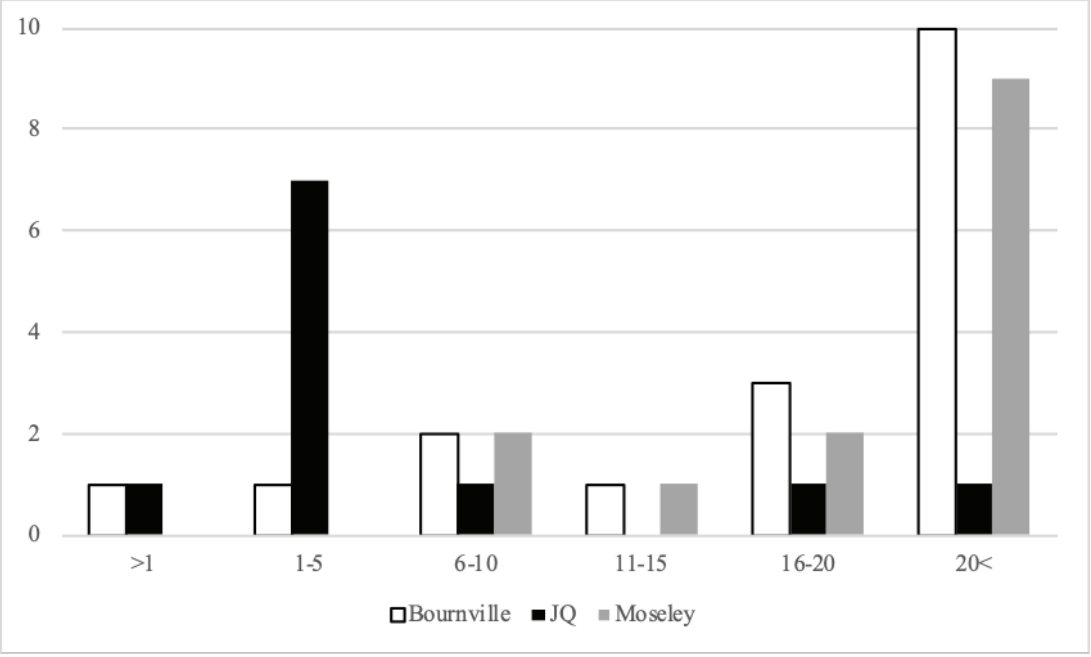


Figure 3.5: Amount of time participants had been associated with the area.

III. Data collection

The data collection period of the research can be divided into two parts. The first, involved an unaccompanied walk around the area undertaken by the participant wearing a biosensing wristband and a chest mounted GoPro camera whilst carrying a global positioning system (GPS). The participants were not asked to follow a pre-determined walk but a route of their choosing. This allowed the participants to go to the places that mattered to them or even explore new places previously unknown to them. Immediately after, the participants undertook a semi-structured elicitation interview using the footage from their walk that concentrated on their choice of route, feelings, experiences, memories, and the surrounding environment. Combined, this methodological approach sought to uncover and combine the spatial, psychological, effable, and visual aspects of experience through both quantitative and qualitative measures.

Biosensing

The biosensing technology used (the Empatica E4 wristband) was a non-intrusive, wearable, and wireless multi-sensor device for real-time computerised biofeedback and data acquisition (Table 3.3). As such, the wristband allows the reading of sympathetic physiological response outside of the laboratory to the standard of that within a laboratory setting (Empatica, 2016; Garbarino et al., 2014)

Table 3.3: Empatica E4 Wristband sensors and frequency of data points (after Empatica, 2014; from T. Osborne, 2019, p. 70)

Sensor	**Modality**	**Unit**	**Frequency (Hz)**
Electrodermal Activity (EDA)	The electronic conductance on the skin.	Microsiemens (μS)	4
Thermistor	Skin temperature.	Degree Celsius (°C)	4
Blood Volume Pulse (BVP)	Blood flow.	nanoWatt (nW)	16
Heart rate	The speed of the heartbeat.	Heart beats/minute (bpm)	N/A
Tri-axial accelerometer	Linear acceleration of wrist in *x*, *y*, and *z*	Metres/second^2 (g's)	4

It is important to stress, however, that biosensing wristbands have been argued by cognitivist scholars not to be most reliable measure of emotional response. Indeed, Studio Huss (2016) has argued that EEG is a better measure for emotional response since the researcher is able to determine which areas of the brain are activated. To allow the participants to be less self-conscious when walking in the public domain, the wristband is an effective instrument, in comparison to a mobile EEG helmet, to record physiological response. Using different combinations of these measures, it is possible to infer the various emotional reactions that the participant experienced (T. Osborne & Jones, 2017).

Alongside the ethical concerns discussed previously, there are always unforeseen issues that occur during the data collection process. This research, especially with the intensive use of technology, was subject to such limitations. Firstly, the biosensing wristband can sometimes fail to take accurate readings. This typically occurs when the wristband is poorly fitted or worn incorrectly; for instance, if the EDA's electrodes are not placed tightly on the ventral (inner) wrist it will not be able to record the electrical conductance. As such, the wristband was fitted by the researcher on the participant to ensure it was correctly done.

Even so, taking a recording of the heart rate from the wrist is not ideal. A study that compared the accuracy of wrist-worn heart rate monitors to those on the chest found "variable accuracy among wrist-worn HR monitors" and that "none achieved the accuracy of a chest strap-based monitor" (Wang et al., 2017, p. 104). Asking the participants to wear a chest-strap, however, would have been problematic, because the GoPro harness would have affected the pressure of the strap on the chest. Whilst the measure will probably not be an accurate representation of the heart rate of the individual, the biosensing data is only meant to provide an inclination as to what occurred to the body at a given moment. Indeed, it has been shown that the physical fitness, environmental conditions, and state of mind impact upon the biodata (T. Osborne & Jones, 2017). Even so, new knowledges can be uncovered using biosensing technologies in an interdisciplinary mixed methods approach.

GPS tracking

In addition to the biosensing wristband, a Garmin eTrex10 was carried by the participants and created a tracklog of their walk. The GPS was set up to produce a log every second, thus producing over 2,700 spatial data points per participant split between forty tracklogs which recorded *x*, *y* and *z* geo co-ordinates as well as a timestamp.[51] As such, these logs could be joined with the biodata through the timings to produce 'emotional maps' like those discussed previously (also see Perkins, 2004, 2009).[52] Whilst these maps can be used to identify how the immediate environment effects the body, they do not give a full picture of the events and processes that occur at that moment. Therefore, it is important to contextualise the physiological reactions in space with qualitative or visual data.

The GPS data was also adversely affected by (hard/software) errors. A major issue of using a GPS in the urban environment is multi-path error, or GPS drift (Kos et al., 2010). The multipath error is largely caused by human-made objects (mainly buildings) which reflect the signal and consequently distort the recorded position of the GPS by a distance of metres to tens of metres. This minor error caused some of the tracks to appear as if the participant walked through buildings rather than along the roads. However, this did not limit the

[51] A total of 2700 data points is based on the average walk being forty-five minutes long: $\Sigma = 45x60$.

[52] Joining is a process available through ArcGIS which allows data sets to be joined based on shared attributes. The shared attributes in this project was the timestamp of the bio and spatial data.

research process in any way since the biosensing maps could still be read and understood effectively and in most cases the drift was only around 5-10m. One GPS issue that could not be resolved, however, was the loss of signal. In two of the walks the GPS was unable to receive a signal for large sections of the walk due to going into a building or a GPS malfunction. When this occurred, the tracklog would have large breaks or even not record a log; as such, these maps were unusable, and the data had to be disregarded for this project.[53]

Video elicitation interviews

During each walk the participants wore a GoPro video camera which enables the production of a rich and *continuous* collection and presentation of visual data (Garrett, 2011b). Mobile videography is an effective method for recording geographic experiences of place, situated in and around the videographer's field of vision while in motion (Chalfen, 2014; Spinney, 2009). Attaching a stationary camera to a moving body produced a full (and uncensored) representation of the walks in real time. Approximately 34 hours of footage was produced, and whilst at times it was difficult to watch,[54] the quantity of (and variations in) the footage meant that is was a very effective elicitation tool for the subsequent interviews.

Following the walk, each participant undertook a video elicitation interview (VEI) (which was recorded via dictaphone) about the various spaces they passed through, with an interest in their emotional responses and memories. Whilst it has been shown that go-alongs or walking interviews are effective in capturing people's feelings about and memories of place (D. Adams & Larkham, 2015; Degen & Rose, 2012; J. Evans & Jones, 2011), the presence of a researcher quizzing the participants about the space *in situ* may stress the participant, and thus influence the biodata. In contrast to walking interviews, the passive approach to the VEI allowed the participants to speak freely about the spaces they encountered without frequent interruptions from the researcher. As such, all the participants could speak freely about their feelings, personal memories, and honest accounts about the area whilst being prompted by the video footage.

[53] A total of three tracklogs failed during the data collection period.

[54] Since the camera was attached to the moving body, it was subject to the sways or plods of walking. Consequently, the footage was often shaky and can cause motion sickness in some people.

Table 3.4: Examples of interview questions, based around key themes.

Theme	Questions
Urban exploration	Where did you go on your walk and why?
	Were there any surprises when you were walking?
Area	What are the good things about Bournville/Jewellery Quarter/Moseley?
	What are the bad things about Bournville/Jewellery Quarter/Moseley?
	What, if any, changes would you make to the area?
Emotion & memory	Where were you happiest on the walk today?[55]
	Where were you saddest on the walk today?
	What was the most memorable moment on the walk?
	Did you remember anything when you were walking?

The VEIs were typically forty-five minutes in length (the same length as the participant's walk). Due to the long length of the interview, and its reliance on often mundane video footage, there was the risk that the participant would lose interest in the VEI and choose to scrub[56] through sections of the video footage that was not of interest to them. To combat this issue, the VEI adopted a semi-structured design that was led by the video but also had some pre-determined core questions or themes (Table 3.4). These questions were not an integral part of the data collection process but maintained the conversation between the researcher and participant.

IV. Data processing & collation

Following the data collection period, all the interviews were transcribed verbatim.[57] At first, timestamping the transcripts was considered to better align the video, biosensing and interview data, but this proved impossible since some of the participants chose to scrub through parts of the video that they found uninteresting or were a means to an end.

[55] Happiness and sadness were chosen to elicit valance from the participants as opposed to positive and negative which were often misunderstood when asked.

[56] Scrubbing is an interaction with video or audio whereby the user drags a cursor or playhead across a segment to skip it.

[57] Verbatim transcription is the word-for-word duplication of the interview data from the audio file (Halcomb & Davidson, 2006).

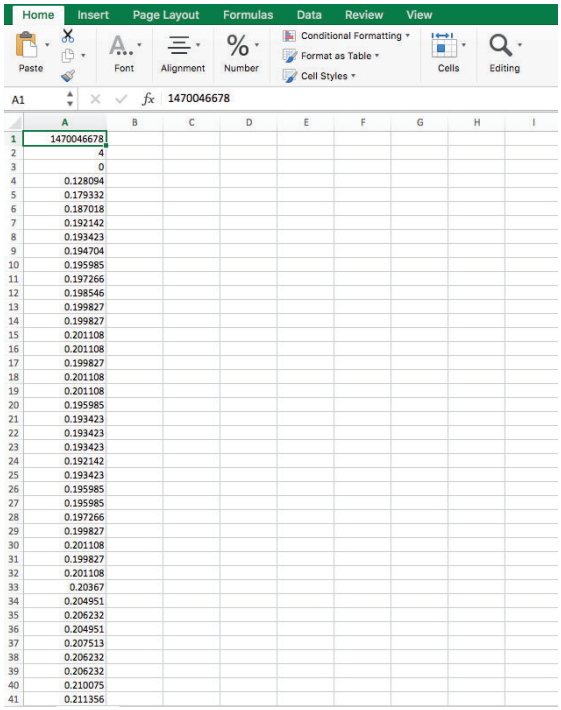
Consequently, the alignment was undertaken spatially by asking the participants to detail which specific spaces they were whilst talking about their experiences.

The biodata was more complicated to process. Following the data collection all the biodata was imported into Empatica's secure cloud platform (https://www.empatica.com/connect/) where it could be downloaded in plain text (Figure 3.6). Each measure had its own .csv file which had to be combined and correlated with the other measures and spatial data. This was achieved by processing the correct timestamp for each individual reading using the epoch time highlighted in Figure 3.6, and then linking them with the timestamps from the GPS using the LOOKUP function in Excel to create a full data set (Figure 3.7).[58] Through this process, a set of spatialised and temporalised biodata was produced for every individual walk which could be spatially represented with the use of GIS, and the biosensing measures could be effectively compared to infer the emotions felt (cf.

). The issue with this process, however, was that only every fifth biosensing reading was included in the final data set because the GPS took one reading per second whilst the wristband took a reading every 0.25 seconds. Even so, each walk produced over 18,000 individual data points,[59] including the spatial data. Biosensing produces a vast quantity of data, and it therefore can be unmanageable at times. Fortunately, this reduction made the data better suited for the time constraints of a PhD.

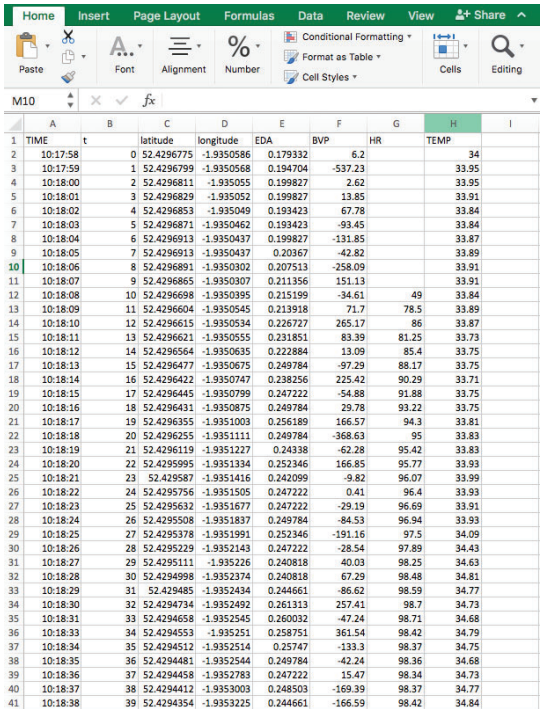
[58] Also see Appendix 5: Formatting Empatica Data and Appendix 6: Creating a master file for ArcGIS.

[59] An estimated total of 18900 data points is based on the average walk being forty-five minutes long and there being seven individual measures: $\Sigma = 7(45x60)$.



	A
1	1470046678
2	4
3	0
4	0.128094
5	0.179332
6	0.187018
7	0.192142
8	0.193423
9	0.194704
10	0.195985
11	0.197266
12	0.198546
13	0.199827
14	0.199827
15	0.201108
16	0.201108
17	0.199827
18	0.201108
19	0.201108
20	0.195985
21	0.193423
22	0.193423
23	0.193423
24	0.192142
25	0.193423
26	0.195985
27	0.195985
28	0.197266
29	0.199827
30	0.201108
31	0.199827
32	0.201108
33	0.20367
34	0.204951
35	0.206232
36	0.204951
37	0.207513
38	0.206232
39	0.206232
40	0.210075
41	0.211356

Figure 3.6: Screenshot of raw data output from Empatica E4.



	A	B	C	D	E	F	G	H
1	TIME	t	latitude	longitude	EDA	BVP	HR	TEMP
2	10:17:58	0	52.4296775	-1.9350586	0.179332	6.2		34
3	10:17:59	1	52.4296799	-1.9350568	0.194704	-537.23		33.95
4	10:18:00	2	52.4296811	-1.935055	0.199827	2.62		33.95
5	10:18:01	3	52.4296829	-1.935052	0.199827	13.85		33.91
6	10:18:02	4	52.4296853	-1.935049	0.193423	67.78		33.84
7	10:18:03	5	52.4296871	-1.9350462	0.193423	-93.45		33.84
8	10:18:04	6	52.4296913	-1.9350437	0.199827	-131.85		33.87
9	10:18:05	7	52.4296913	-1.9350437	0.20367	-42.82		33.89
10	10:18:06	8	52.4296891	-1.9350302	0.207513	-258.09		33.91
11	10:18:07	9	52.4296865	-1.9350307	0.211356	151.13		33.91
12	10:18:08	10	52.4296698	-1.9350395	0.215199	-34.61	49	33.84
13	10:18:09	11	52.4296604	-1.9350545	0.213918	71.7	78.5	33.89
14	10:18:10	12	52.4296615	-1.9350534	0.226727	265.17	86	33.87
15	10:18:11	13	52.4296621	-1.9350555	0.231851	83.39	81.25	33.73
16	10:18:12	14	52.4296564	-1.9350635	0.222884	13.09	85.4	33.75
17	10:18:13	15	52.4296477	-1.9350675	0.249784	-97.29	88.17	33.75
18	10:18:14	16	52.4296422	-1.9350747	0.238256	225.42	90.29	33.71
19	10:18:15	17	52.4296445	-1.9350799	0.247222	-54.88	91.88	33.75
20	10:18:16	18	52.4296431	-1.9350875	0.249784	29.78	93.22	33.75
21	10:18:17	19	52.4296355	-1.9351003	0.256189	166.57	94.3	33.81
22	10:18:18	20	52.4296255	-1.9351111	0.249784	-368.63	95	33.83
23	10:18:19	21	52.4296119	-1.9351227	0.24338	-62.28	95.42	33.83
24	10:18:20	22	52.4295995	-1.9351334	0.252346	166.85	95.77	33.93
25	10:18:21	23	52.429587	-1.9351416	0.242099	-9.82	96.07	33.99
26	10:18:22	24	52.4295756	-1.9351505	0.247222	0.41	96.4	33.93
27	10:18:23	25	52.4295632	-1.9351677	0.247222	-29.19	96.69	33.91
28	10:18:24	26	52.4295508	-1.9351837	0.249784	-84.53	96.94	33.93
29	10:18:25	27	52.4295378	-1.9351991	0.252346	-191.16	97.5	34.09
30	10:18:26	28	52.4295229	-1.9352143	0.247222	-28.54	97.89	34.43
31	10:18:27	29	52.4295111	-1.935226	0.240818	40.03	98.25	34.63
32	10:18:28	30	52.4294998	-1.9352374	0.240818	67.29	98.48	34.81
33	10:18:29	31	52.429485	-1.9352434	0.244661	-86.62	98.59	34.77
34	10:18:30	32	52.4294734	-1.9352492	0.261313	257.41	98.7	34.73
35	10:18:31	33	52.4294658	-1.9352545	0.260032	-47.24	98.71	34.68
36	10:18:33	34	52.4294553	-1.935251	0.258751	361.54	98.42	34.79
37	10:18:34	35	52.4294512	-1.9352514	0.25747	-133.3	98.37	34.75
38	10:18:35	36	52.4294481	-1.9352544	0.249784	-42.24	98.36	34.68
39	10:18:36	37	52.4294458	-1.9352783	0.247222	15.47	98.34	34.73
40	10:18:37	38	52.4294412	-1.9353003	0.248503	-169.39	98.37	34.77
41	10:18:38	39	52.4294354	-1.9353225	0.244661	-166.59	98.42	34.84

Figure 3.7: Screenshot of a complete biosensing and spatial data set.

V. Independent analyses

With such a huge and multifaceted data set, it was important to analyse each data set individually to uncover the initial meaningful insights, trends, and relationships. These initial findings then became the focus of the combined analyses (Stage VI). These independent analyses included open coding of the transcripts, identifying emotional 'events' through graphical visualisation, and identifying spatial trends in the (e)motional maps. Since these analyses only consider one (or two in the maps) data sets, however, these analyses provide the building blocks for the combined analyses and the arguments that underpin the empirical chapters of this thesis (Chapters 6 – 8).

Interviews

Due to the lack of timestamping, the transcripts were complete bodies of text which were coded in NVivo 10 using Strauss' grounded theory approach (1987), combining both open and axial coding systems. In this two-step system, open coding is first undertaken by developing nodes from the content of the transcripts. These tentative labels are not based on theory, just the content of the transcripts (Cope, 2010). This method of coding, however,

can produce hundreds of nodes and it is therefore necessary to analyse the nodes produced. As such, axial coding was adopted to find the broader categories uncovered by the data by using concepts and theories to categorise the nodes (Strauss, 1987). The categories where then combined into broad patterns, namely the physical environment, memory, and heritage which form the empirical chapters of this thesis (Figure 3.8). Crucially, this method of coding was not done in accordance with a pre-existing framework or theory; its open and reflective nature, however, was able to uncover patterns and themes that the participants deemed significant.

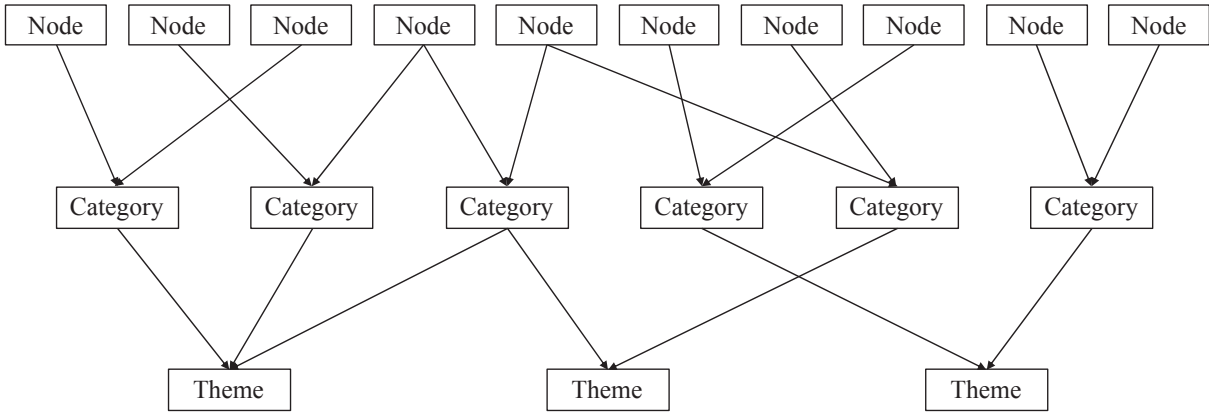


Figure 3.8: Grounded theory coding (after Strauss, 1987).

Biodata

Using the collated raw biodata, it was possible to create graphs to compare the results between various biosensing measures for each individual walk (Figure 3.9). While other scholars have developed complex statistical models to analyse biodata (Drachen et al., 2010; Yannakakis et al., 2008), this research adopted a manual approach to analysing the biodata. These complex statistical models tend to interpret the statistical trends of the biodata (such as a decrease in stress over time) as opposed to the 'events'[60] in the data (Yannakakis et al., 2008). As demonstrated in previous research (Nold, 2009; Ruskamp, 2016), it is possible to undertake good research using biodata without using complex code and statistical analyses. Furthermore, it was a concern that identifying emotional response with a series of equations and numbers could led the deeply problematic objectification of the participants, their bodies, and their inferred emotions.

[60] 'Events' here refer to the data points that do not fit the broad trends in the biodata.

A series of graphs were developed to visualise the variations in EDA, HR, skin temperature and BVP (for example Figure 3.9), and how these variations compare to each other. In Figure 3.9, for example, in the highlighted area there is a short, but approximately consistent, decline in EDA whilst there is an increase in the heart rate. According to Figure 3.9, these measures would imply that the participant felt happy at this moment; however, this cannot be confirmed or contextualised without consulting the qualitative and spatial datasets. Even so, the biosensing graphs for each participant were used to identify the major (non-statistical) anomalies or events in the data set, which were then compared to the three other measures from the biosensing wristband.

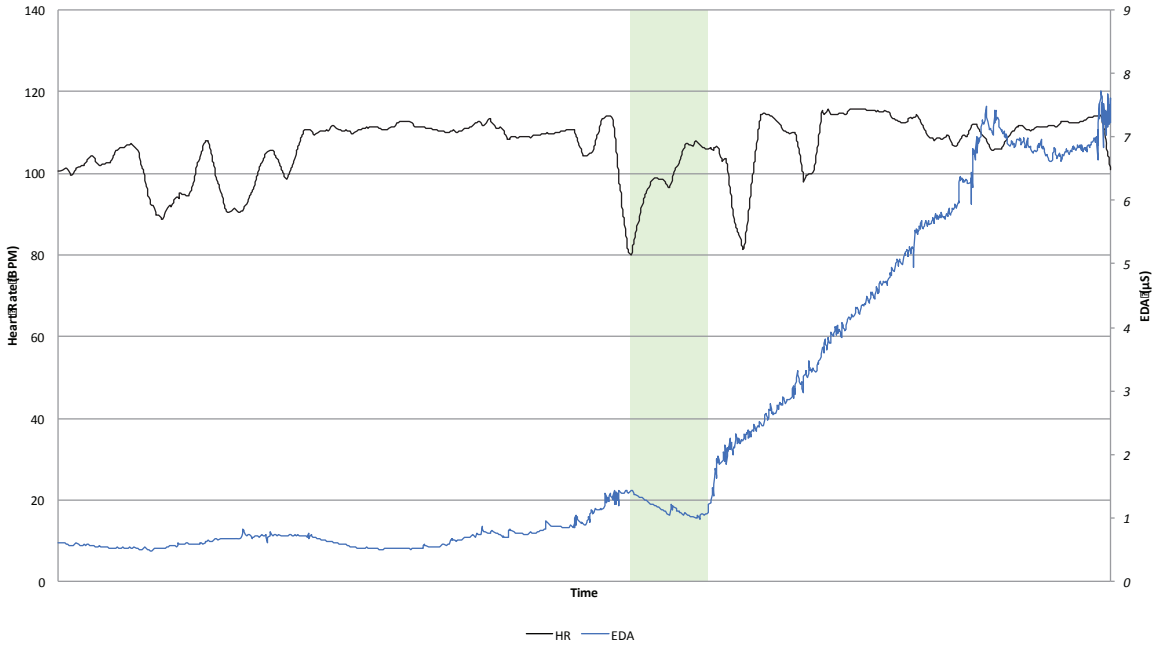


Figure 3.9: Biosensing graph – Terence, EDA and HR.[61]

(E)motional Maps

In addition to the biosensing graphs, the combination of spatial- and biodata permitted the production of a series of "emotional maps", similar to those discussed previously (Figure 3.10). The biosensing maps were produced in ArcGIS using the spatial data and one

[61] This example will be discussed in detail in Chapter 7.

biosensing measure.[62] Each .csv file was imported into ArcGIS as *xy* data (effectively latitude and longitude) where each row was presented on the map as a single dot. To spatially present the biodata, the symbology of each dot was changed to the reflect the value of the biodata. For instance, in Figure 3.10, the red dots represent a high EDA reading whereas the green dots represent a low EDA reading.[63] The colours were categorised using an equal interval classification of five. This function in ArcGIS divides the range of attribute values in equal-sized subranges. This method stresses the amount of an attribute value relative to the others, so is possible to spatialise the spikes and troughs as well as the broad patterns (all of which can be seen in Figure 3.10).

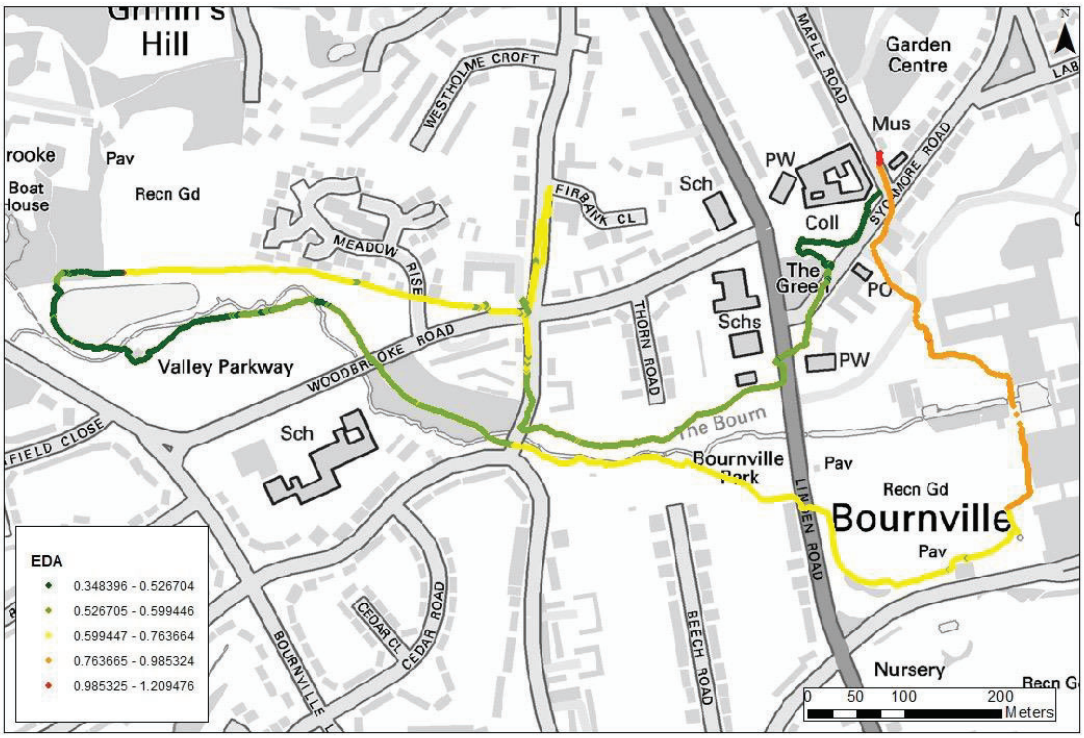


Figure 3.10: "Biosensing map" – Max, EDA.

[62] Using ArcGIS, it is only possible to effectively display one variable on a map. Whilst with the use of 3D mapping, it would be possible to display two variables, a 3D map is only effective as an interactive display tool as opposed to a final 2D product.

[63] To define low and high EDA the complete data set was classified into five equal intervals. This approach divides a data set into equally sized (sub)ranges which are able to stress the quantity of a (sub)range relative to the others.

When aggregating biodata of multiple individuals, however, it is impossible to combine the raw data sets because everyone exhibits their own physiological responses. For example, one person may be naturally sweatier than another and therefore have a higher average EDA reading. Thus, for an effective comparison to occur all the raw data would have to be normalised by calculating each data point's standard score (or z-score) which represents how much the raw data point varies from the arithmetic mean in terms of standard deviation. By undertaking this statistical work, it was possible to compare the data of the individual participants. However, it has been argued that getting a statistical output from biosensing data "from hundreds of subjects is impossible and has no meaning" (Lee et al., 2005, p. 5523). Indeed, this method removes individual difference and assumes that the participants responded in the same way.

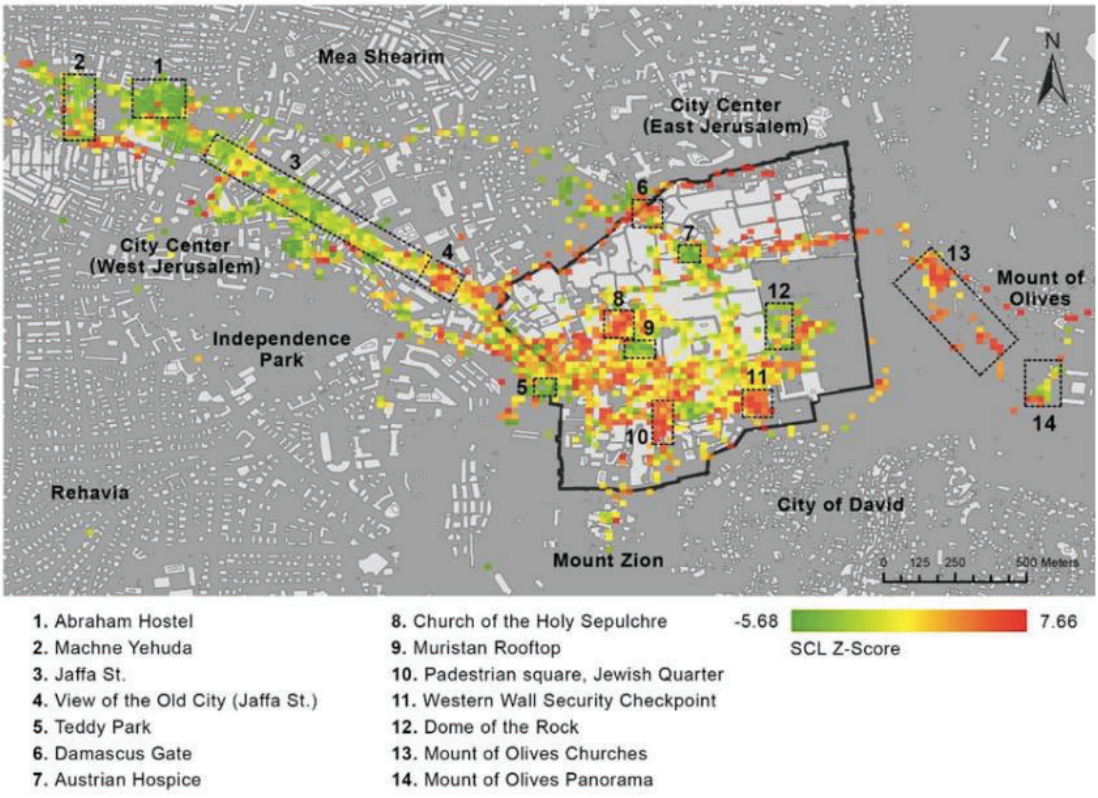


Figure 3.11: Standardised EDA map for Jerusalem (from Shoval et al., 2018a, p. 10)

Other scholars, namely Shoval et al. (2018a; 2018b), have used this process to compare 68 participants and produce standardised maps for EDA by averaging the data within $20m^2$ cells (Figure 3.11). Shoval et al.'s study, however provides some sweeping conclusions, because they did not consider the effects of walking uphill or the typical hot weather on a

prolonged walk around the city of Jerusalem yet claimed that the Mount of Olives (with an elevation of 826m in a hot climate) was emotionally evocative. Also, as Figures 3.12 & 3.13 demonstrate, incidents of standardised high EDA and low EDA tended to overlap in most areas across Bournville (with some exceptions).

Whilst considering each walk individually may be incredibly time consuming, it could effectively consider the unique characteristics of each walk (including weather, route, and topography) and the social factors (histories with spaces, place attachment etc.) in tandem. As such, this process better suits a biosocial approach in comparison to the standardising approach adopted by others. Regardless, the various types of data produced in this research per walk meant that effective analytical frameworks had to be developed to consider all the data sets simultaneously.

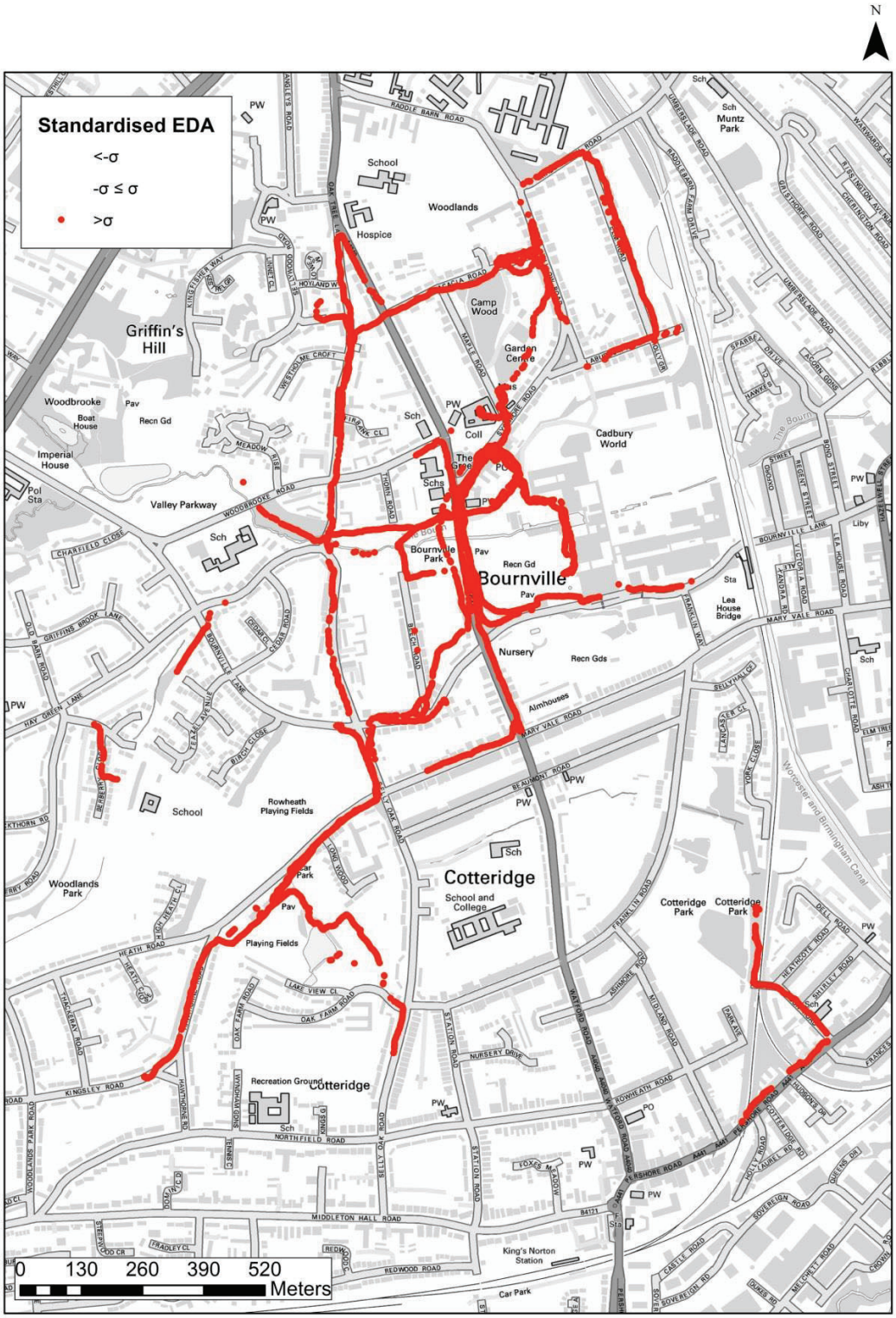


Figure 3.12: Standardised EDA map (>σ)

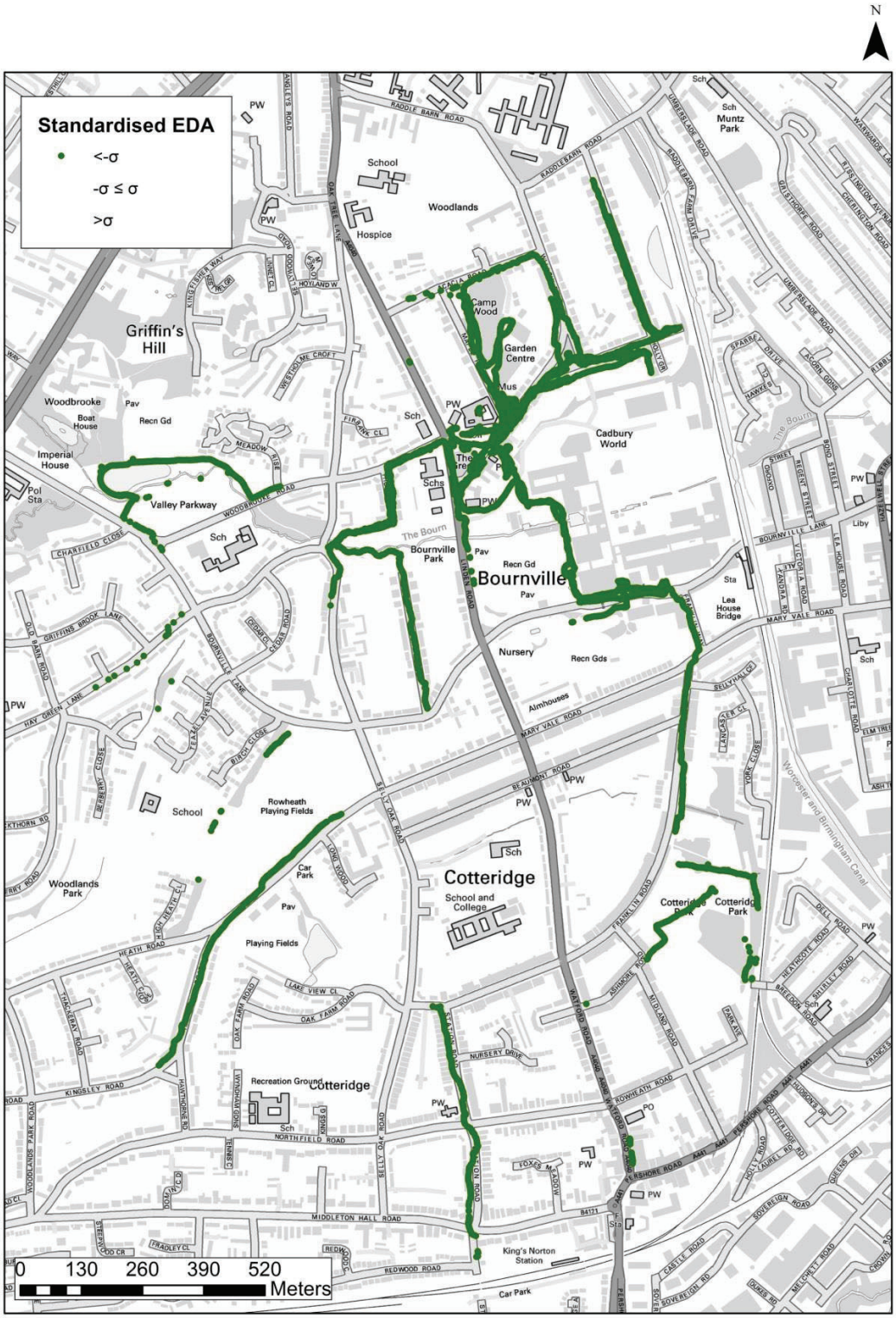


Figure 3.13: Standardised EDA map (<σ)

VI. Combined analyses

In order to fully integrate the four methods, data, and analyses, it was important to develop an iterative analysis strategy to aid towards building theories and coming to strong conclusions (Philip, 1998). Consequently, three cross-analyses were developed and implemented: *environment*-led (Figure 3.14), *thematic*-led (Figure 3.15), *biosensing*-led (Figure 3.16) (T. Osborne & Jones, 2017).

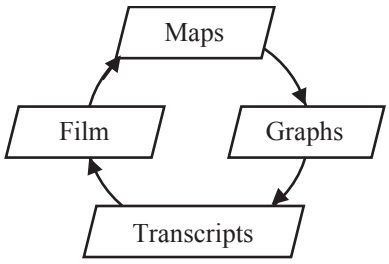


Figure 3.14: Environment-led analysis

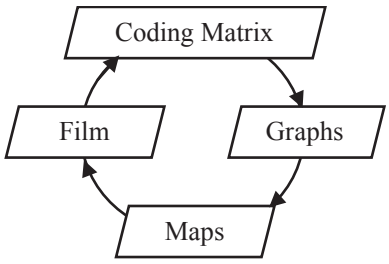


Figure 3.15: Thematic-led analysis

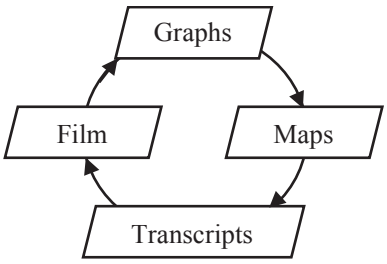


Figure 3.16: Biosensing-led analysis

These three analyses built upon Knigge and Cope's (2006) grounded visualisation analytical approach which draws upon feminist, critical GIS, and grounded theory to develop an analytical approach that is exploratory and experimental (cf. Fitzgerald & Callard, 2015), iterative and recursive (Philip, 1998), considers particular instances and general patterns (cf. Bailey et al., 1999; Strauss, 1987), and multiple views and perspectives for building knowledge (cf. Reinharz & Davidman, 1992; G. Rose, 1993). Simply, grounded visualisation is an analytical approach that integrates the visualisation techniques of GIS with the critical nature of grounded theory. Both visualisation and grounded theory are exploratory and iterative (Knigge & Cope, 2006) and therefore both methods of analysis are suitable for an experimental and exploratory. But when combined into a grounded visualisation analytical framework, it is possible to consider both the quantitative and qualitative datasets in tandem and "accommodate and represent multiple interpretation of

the world and diverse views of reality" (Knigge & Cope, 2006, p. 2028). Using this study as an example, a grounded visualisation approach allowed the subjective knowledges of the interviews to be heuristically and reflexively compared and contrasted with the multi-representational space(s) of the (e)motional maps. Grounded visualisation, therefore, allows researchers to "recursively explore data in order to identify themes and processes, raise new questions, and begin to build theories" (Knigge & Cope, 2006, p. 2026) that is both 'grounded' in everyday experiences but also 'visualised' and contextualised within broader (spatial) trends and patterns. Each of the following analyses led with a specific dataset or finding from the independent analysis but then incorporated the other datasets in turn to be iterative and reflexive and to contextualise and conceptualise thus, providing a robust analytical framework to interrogate the data.

Environment-led analysis

Environment-led analysis used the biosensing maps to determine the spatialities of the broad patterns and rapid fluctuations in the biodata. The use of maps, however, is limited by questions of epistemology, representation, and power; it was necessary, therefore, to explain and contextualise the spatial variations within the data. This contextualisation was first done by returning to the biosensing graphs, which not only suggest what emotion was felt in the given space, but also identify whether the physiological response could be explained as physical exertion or 'recovery'. Whilst these two sets of data may provide an indication of what happened, it is of paramount importance that the physiological responses are contextualised in order to consider the subjectivity of emotion, memory, and embodied experience. As such, the transcripts of each individual walk were consulted for the expressed emotion, memory, and/or experience at each given space.[64] In some instances, however, the participants did not detail an experience that was reflected in the biodata. Whilst it was uncommon, the video footage did provide an indication of what happened. For instance, a spike in EDA that was contextualised by the participant may have been explained by a loud noise in the video. By using this mode of analysis, it was possible to identify the effect of the surrounding environment on the participants, which is discussed in detail in Chapter 6.

[64] The individual spaces were identified by the researcher or the researched during the interview to ensure that comparison between the datasets was possible.

Thematic-led analysis

In the thematic-led analysis, the coding matrix was initially considered. As demonstrated previously, Strauss' grounded theory coding produced a plethora of categories and patterns in the qualitative data which formed a coding matrix (Figure 3.17). Unfortunately, it was difficult to correlate the coding matrix with the biodata directly because the interviews were not timestamped. Consequently, the significant themes had to be identified in the biodata using the maps because significant urban features (including architecture), the 'natural world', places of memory, and features of urban planning could be identified cartographically. Because the biosensing maps and graphs are easily comparable it was possible to identify the various physiological reactions that occurred when the participants were experiencing these significant qualitative themes (which, again, was contextualised by the video footage). This form of analysis, however, highlights an issue with interdisciplinary work: it be difficult for the datasets to correlate (Klein, 1990; Strang & McLeish, 2015). The theme 'social' (shown in the grey box in Figure 3.17), for example, cannot be identified in the biodata unless the nodes are also coded with a spatially-identifiable node.

Figure 3.17: Coding matrix

Biosensing-led analysis

The third mode of combined analysis biosensing-led, involved looking at the biodata for spikes/troughs or fluctuations in the data and then using the interview or video data to contextualise them. Since the data set was incredibly large, EDA was used as the primary focus for measuring arousal. Using EDA, three types of response were identified:

- little/no variation: 12/40
- broad patterns or fluctuations: 17/40
- rapid spikes and troughs: 11/40

Typically, the rapid spikes and troughs could be contextualised using the video data, but the broad patterns or fluctuations needed further analysis. As such, it was necessary to use the biosensing maps to consult the interview transcripts, as a means to obtain the effable responses to justify and contextualise the biosensing fluctuations in a similar fashion to the environment-led approach.

Since each of these analyses considered each of the data sets, there was no need to bring these approaches together. Instead, and following the ground visualisation framework, it was important to adopt a recursive and reflexive set of analyses that do not proceed along a linear course but are instead often multiple, messy, and fluid (Knigge & Cope, 2006; Philip, 1998). Furthermore, these three analyses also adhere to Fitzgerald and Callard's (2015) experimental approach by removing the boundaries between the methods, analyses, and discipline, thereby not privileging one particular method or form of analysis. Whilst the different analyses are able to uncover different interpretations of the various qualia that stirred a psychophysiological reaction from the participants, it is also important to reflect on the fact that the interpretations may be contradictory. When contradictory perspectives arise in a grounded visualisation analytical approach, these results are not disregarded (Klenotic, 2011; Nightingale, 2003); instead, the heterogeneity establishes new research questions and helps to produce a complex explanatory narrative which is able to capture multiple social meanings across different spatial scales. Indeed, in Chapter 8 discusses the multiple, and often conflicting, responses to spaces of ruination. Regardless, the three analyses used in tandem allows the different interpretations to be contextualised, supported, or negated by each of the datasets to produce a robust biosocial account of each individual walk which could then be compared.

3.3 PRESENTATION OF THE COMBINED DATA SETS

To present these various strands and types of data as a single entity, various data visualisations and presentations have been adopted throughout the empirical chapters. Whilst the presentation approaches may vary from chapter to chapter[65] a collection of visualisations have been produced to unify and overlay the different data sets, namely the biomaps (with annotations) and *Dashware* video stills (which I explain below).

Annotated biomaps

As discussed previously, the GPS and biosensing data were combined to form biosensing maps. In doing so, these maps are able to display the spatialisation of physiological reaction, whether that is a decline in EDA around a lake (discussed in Chapter 6) or spaces of increased fluctuation in BVP in different spaces in an area (discussed in Chapter 7). These maps, however, failed to visually contextualise and conceptualise the physiological events. As such, a series of maps were produced with textual and visual annotations (Figure 3.18). By adding the qualitative data to the maps, it provides "rich descriptive detail about … shifting social and material processes and processes (Cope & Elwood, 2009, p. 3). Consequently, the use of qualitative GIS has been used to great effect in many areas of geography, such as health (Meijering & Weitkamp, 2016), socio-cultural (Boschmann & Cubbon, 2014), and children's geographies (Elwood & Mitchell, 2012; Jarvis et al., 2017), because the maps are able to spatialise people's perceptions, preference, and values on a specific topic. Indeed Alarasi et al. (2016, p. 449) demonstrated how "by geographically overlaying information and by exploring relations using querying functions of the textual analysis, [they] were able to obtain valuable insights [which] also proved to be insightful to the city planners".

[65] For example, Chapter 5 uses more quantitative data whereas Chapter 6 is underpinned by vignettes and textual data.

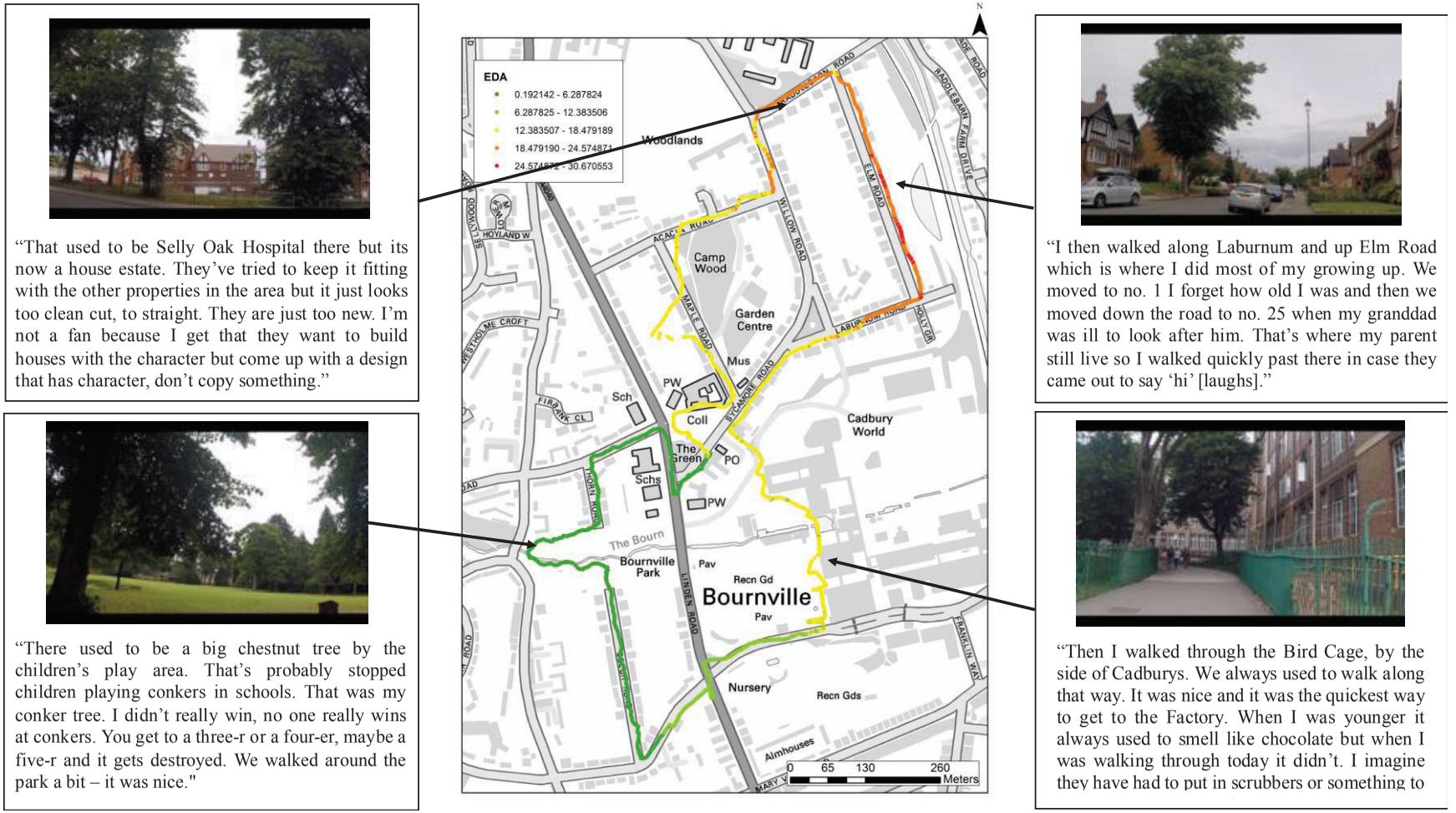


Figure 3.18: Rick's EDA Map with visual and textual overlays

Dashware video

The second visualisation method effectively combines the bio-, spatial, and visual data in the form of a video. The software *Dashware* allowed the overlay of data on top of video footage to create a multifaceted visual account of each individual walk with second-by-second data.[66] As such, it allowed the video footage to be used beyond an elicitation tool. In Figure 3.19, for instance, TEMP (°C), HR (bpm), and EDA (μS) are displaying in the bottom right-hand corner with the route map in the bottom left. The thesis, as a textual entity, however, limits how the *Dashware* videos can be used as a data visualisation. Whilst analysing the videos has been effective tool for identifying triggers that were not identified/remembered by the participants, a short video cutting cannot be effectively included within the thesis. As such, this thesis can only use stills from the video in attempt to display the audio-visual triggers that the participants were subject to. As such, the Dashware videos were more of an analytical tool to understand the data as opposed to displaying the analysis in this thesis.

Figure 3.19: Screenshot from Dashware video

[66] Additional information on Dashware can be found at http://www.dashware.net/

For the majority of the thesis, however, the data is primarily presented through interview quotes, biomaps (e.g. Figure 3.10) and graphs (e.g. Figure 3.9) which are collated/combined in the discussion and are explained in detail in the captions. Although these captions were lengthy, it allows the thesis to discuss the intricacies of the figures while not distracting from the overall argument or the connections between the different data sets. Furthermore, the complete data set is presented in the biomaps and graphs to emphasise how the particular emotional event being discussed relates to the rest of the walk.

3.4 CONCLUSION: EXPANDING UPON BIOSOCIAL METHODOLOGIES

Over the last two decades, interest in interdisciplinarity within and beyond academia has grown substantially (see, for example, Callard et al., 2015; Cromby, 2007; Lindley & Youdell, 2016; Prout, 2005). This is particularly the case across the humanities and social sciences in recent years with the ongoing calls for cross-disciplinary collaboration often with a multi-method and multi-theoretical approach (e.g. AHRC, 2017; ESRC, 2014). This call for interdisciplinary work, including that adopting biosocial approaches, has been enhanced by technological and methodological developments for taking biological measures in non-clinical settings which are increasingly being incorporated into social science research projects (e.g. de Freitas, 2018; T. Osborne, 2019; Tatler et al., 2016). Indeed, this study is one of the first examples of biosensing technology used out of a clinical-setting.[67] This methodology, therefore, bridges the gap between social and (traditionally) clinically-based approaches to consider and discuss the interaction of biological and social worlds. Thus, this methodology allows for the recognition of the complex interplay between social, environmental and biological processes – a previously underexplored area of geography.

[67] Others include Christian Nold (2009), Elizabeth de Freitas (2018), Shoval et al. (2018a, 2018b), and Resch et al. (2015; 2016).

As well as developing and exemplifying a framework for interdisciplinary, mixed-methods biosocial geographies, this chapter has outlined and discussed the complex methodological approach adopted for this research: interdisciplinary mixed methods using biosensing, mobile video ethnography, (e)motional mapping, and elicitation interviews. Whilst the processes of utilising multiple methodologies to produce a depth and breadth in findings may be more difficult than the use of one method (Tashakkori & Teddlie, 2003), the mixed method approach adopted here strengthened the project in three major ways. Firstly, the mutually informing methodological approach provided additional confidence in the relationship between the different datasets, especially when the findings from one dataset is also present in another. Secondly, the combined analyses of the various datasets produced a robust measure for researching body-landscapes through thorough cross-examination that is exploratory, iterative and recursive, and allows for multiple subjectivities. Thirdly, the various methods produced a multifaceted account of the body-landscape with each method capturing a different aspect of the interplay between social, biological, and environmental processes for each participant.

A significant part of this research was to use biosensing technology a part of an interdisciplinary approach. Whilst biosensors have been used prior to this research (Nold, 2009; Ruskamp, 2016; Zeile et al., 2015), the use of them within geography (and the social sciences in general) has been extremely limited. Biosensing technologies are very exciting tools for geographers interested in exploring the relationship between person and place, and it could be argued that biosensors provide an objective measure for people's emotional responses. It has been demonstrated here (and in previous research), however, that the biosensing data alone needs to be treated with caution and be cross-examined within a suite of methods. Indeed, it has been argued that biodata cannot be unambiguously correlated with a person's actual emotion nor the context in which it arose (Resch, Summa, et al., 2015). Biosensing is a methodological tool with great potential in geography; it could provide new knowledges and interpretations of the body and embodiment and enrich our knowledge of the body-landscape relationship. The strength of biosensing, however, is within a mixed method approach where it is an additional quantified measure that is cross-examined to form a rigorous academic inquiry.

Having developed a biosocial ontology and methodology, the following two chapters will provide a contextual basis for this study through a review of the three case study areas (Bournville, Moseley, and the Jewellery Quarter) (Chapter 4) and a discussion of the three key themes that arose from the case study area's historical, social, and environmental particularities: therapeutic/detrimental landscapes, memory and nostalgia, and living heritage (Chapter 5). Aside from discussing the key geographical literatures in these areas, these chapters go beyond a typical discussion chapter and develop a biosocial understanding of each theme which will provide the basis for each of the subsequent empirical chapters (Chapters 6 – 8).

4

INTRODUCING URBAN CONSERVATION: BOURNVILLE, MOSELEY, AND THE JEWELLERY QUARTER

Having explored and established a biosocial geography we now turn to the case study sites of the research project: Bournville, Moseley, and the Jewellery Quarter. These three areas are examples of urban conservation areas in Birmingham, UK, each with their own special architectural or historic interest (Birmingham City Council, 2016). No conservation area, or heritage feature, is simple. Indeed, heritage is often preserved or protected because they are unique entities. As such, this thesis investigates three types of urban conservation areas to fully appreciate the different features and heritage landscapes with Birmingham. Whilst multiple case study sites are typically used for comparison, there will be minimal comparison between the three case studies in this study because the focus of the study is on the human-environment interaction not the differences between different types of urban conservation area. The use of case studies, however, allow for an empirical inquiry that investigates a phenomenon within its real-life context (Yin, 2013) and is therefore fitting for this study.

This chapter explores the unique qualities of Bournville, Moseley, and the Jewellery Quarter, including their history, populace, and geographies. Furthermore, this chapter will introduce the specific heritage policies that underpin these areas and the city of Birmingham more generally. By discussing the three case study areas in detail, it will highlight the various

processes and spatial features that shape the ways the residents interact and respond with their neighbourhoods. First, however, this chapter will consider the role that heritage policy in Birmingham has upon the areas and their residents.

4.1 HERITAGE POLICY IN BIRMINGHAM

Birmingham, the UK's second largest city, is known for its industrial history tracing back to the Tudor period with the production of iron goods up to the inter-war period where Birmingham grew very rapidly due to the strength of its motor vehicle industries (Cherry, 1994; Holt, 1986). During that time the inner-city areas and city centre were redeveloped, but "without soul" (Slater & Larkham, 1996, p. 241). Consequently, Birmingham has a poor reputation and an image problem. It is recognised as a grey and industrial city with many post-war tower blocks, motorways, and unattractive modernist architecture (Bourke, 2013; Foster, 2005; Slater & Larkham, 1996). But there has been a desire to create a new image of the city to attract tourism, increase levels of service industries, and improve business interest. Part of this strategy was the rapid development and investment in heritage and urban conservation. For instance, Birmingham won £1.7 million from the European Regional Development Fund (ERDF) in 1996 to strengthen and grow the city's destination marketing (Caffyn & Lutz, 1999) and a major part of this fund was to improve Birmingham's heritage as a visitor attraction.

Because of Birmingham's rich industrial past, the city has a variety of historical areas and buildings from the 'Arts and Crafts' style of Moseley and Bournville, to the Jacobean Aston Hall, and the industrial landscape of the Jewellery Quarter. As a result, Birmingham City Council (BCC) has implemented many strategies, events, and polices to promote, preserve, and celebrate Birmingham's historical distinctiveness:

> "In an age of volume house builders, multiple retailers, fast food chains and nationally based leisure groups there is an inevitable sameness about new development across the country. Against this background our historic

> buildings, tradition street patterns and urban landscapes provide a local distinctiveness vital to our sense of place and belonging" (BCC, 1999, p. 1).

Part of this movement towards heritage conservation and promotion was a comprehensive Birmingham conservation strategy implemented in 1992 and then amended in 1999. The Birmingham Conservation Strategies (BCC, 1992, 1999) had ten aims to promote regeneration through conservation:

1. To secure more protection for historic buildings and infrastructure
2. To provide better guidance and advice to owners of historic buildings in regard to alterations and maintenance.
3. To undertake an audit of listed buildings.
4. To enforce protection and maintenance of buildings at risk.
5. To encourage voluntary sector assistance in conservation.
6. To generate interest among the schools for heritage conservation.
7. To secure funding from grant-awarding bodies, such as English Heritage and ERDF.
8. To encourage research on Birmingham heritage and historic buildings.
9. To develop a comprehensive policy for planning control
10. To appoint a field archaeologist to promote archaeology in the city.

This strategy, whilst extensive, fails to account for people's participation and engagement with Birmingham. Instead, it stresses the importance of the material, political, and economic values of heritage. The heritage strategy has since been updated and now accounts for social aspects of heritage with the following aims (Birmingham Museums, 2014, p. 3):

1. Preservation: protecting and managing what we value.
2. Prioritisation: role of Heritage Strategy Group.
3. People: participation and engagement.
4. Promotion: telling the Birmingham story, past, present and future.

Whilst this strategy does explicitly claim to protect what *we* value and aim to engage people there are very few mentions of consulting the public. Instead this strategy hopes to promote and engage the public in the city's heritage through volunteer groups and through work with Heritage Lottery funded youth groups. The lack of direct action with the public in this heritage strategy may be reflective of the government's public spending cuts and may suggest future issues for national heritage (Bingham, 2015) but it provides an opportunity to investigate and stress the importance of the value ascribed to heritage by the public.

As part of these strategies, the city has implemented and maintained a wide collection of conservation areas and listed buildings. In total Birmingham has thirty recognised conservation areas and nearly 1,500 Statutory Listed buildings (Birmingham City Council, 2018b, 2018c). A conservation area, defined as an "area of special architectural or historic interest, the character and appearance of which it is desirable to preserve or enhance" (UK Government, 1990, p. 42), is given that status by a local authority who in turn have increased powers under planning law to maintain and improve the character of the area. These powers include control of development and demolition, protection of trees, work undertaken on vacant unlisted buildings that are in disrepair and the control of advertising.

4.2 CASE STUDY SITES

There is wide range of scales and characters to the thirty conservation areas of Birmingham from a single road, building and estate, or an entire neighbourhood and the time constraints of the PhD process meant that not all areas could be investigated. As such, three case study areas were chosen, Bournville, the Jewellery Quarter and Moseley, which represent a range of the heritage in Birmingham from Moseley's suburban idyll to the industrial remnants in the Jewellery Quarter. These three areas were used as case study sites because they demonstrate the similarities and differences between conservation areas in Birmingham (Table 4.1) where both Moseley and Bournville represent the verdant suburban areas and the Jewellery Quarter is an example of Birmingham's industrial past. As such, each area has its own unique history and very different physical environments. Bournville, for example, is a very green area with many parks and tree-lined streets (as a result of George Cadbury's enthusiasm for nature – discussed later), whereas the Jewellery Quarter only has three green spaces which are all cemeteries. Aside from these differences all the areas are predominately white and middle class which is typical of urban conservation areas (Holyoak, 2016b) despite having varying demographics. For instance, it was shown that the Jewellery Quarter has a younger population then that of Bournville or Moseley. Even so, each of these areas

represent a living heritage site with homes, places of work, and recreational spaces for fairly large populations that are varied in their physical environmental, the longevity of residence, and type of urban heritage

Table 4.1: Comparison table of case study areas

	Bournville	**Jewellery Quarter**	**Moseley**
~Age of area	Built in the early 1900s by George Cadbury	1500, but grew into an industrial centre in the 1800s	Pre-1900 as a small village before being absorbed by the expansion of Birmingham.
Type of heritage	Industrialist model village	Industrial	Disbanded country estates and suburban residential
Architecture	• Arts and crafts • Industrial/factory • Tudor	• Industrial • Victorian town houses • Residential blocks	• Country estates • Victorian villas • Arts and crafts • Edwardian terraces
Population	~25,000 Families and retirees	~7,000 people Young professionals	~25,000 people Families and retirees
Average age (ONS, 2011)	39	31	37
Ethnicity (ONS, 2011)	White: 85% Asian: 8% Black: 4% Other: 4%	Not available[68]	White: 64% Asian: 24% Black: 6% Other: 6%

[68] The Jewellery Quarter is not ward, just a local area, hence there is not accurate ethnicity data.

Bournville, Moseley, and the Jewellery Quarter are all Conservation Areas and therefore bound to planning laws that aim to maintain or improve their special character. This character is a matter of great pride to the local communities as Mary (Bournville resident, female, 55-64-years-old) demonstrates:

> "I think [Bournville] has a strong character so I hope that the people will preserve that. I don't want it to stay stagnant, [but] I think there are enough people that are there to protect what is good about it" (interview with Mary, 19/08/2016).

Moseley, the Jewellery Quarter, and Bournville have a combined population of ~57,000 who are subject to the laws and restrictions imposed upon urban conversation areas. Parts of each area are subject to Article 4(2) Direction meaning that the residents of those areas require planning permission from Birmingham City Council (2010) for the following:

- The enlargement, improvement or other alteration of a house;
- Any other alteration to the roof of a house;
- The erection or construction of a porch outside any external door or house;
- Construction of a hard floor surface (such as a patio or drive) at the front of the house;
- The erection, construction, improvement or alteration (including demolition) of a gate, fence, wall or other means of enclosure;
- The painting of the exterior of any building or wall.

For those who live in the Article 4(2) areas, these laws can be restrictive but eighteen participants (45%) felt that it was important to preserve these areas regardless of the restrictions, and another five (12.5%) believed that conservation was a benefit to the area but should not necessarily hinder careful modernisation.

All these measures are in place to protect each area's distinctive character but also to use it to benefit Birmingham and its residents. Obviously, heritage is an economic resource that is used to promote tourism, economic development and regeneration and this is true for the three areas too: Cadbury World in Bournville continues to break its visitor number record annually (Birmingham Press, 2016, 2017), the Jewellery Quarter Development Trust focused the area's regeneration around its heritage and distinctiveness (Jewellery Quarter Development Trust, 2013, sec. 2), and the house prices continue to rise in the older and gentrified parts of Moseley (Moseley Community Development Trust, 2008). For sure the

economic aspects of heritage conservation will have an impact on the residents of the three areas, but the focus here is heritage as a cultural product and a political resource. By looking at heritage's socio-political function, it is possible to discuss the array of identifications with the area and some of the potential conflicts that arise (especially regarding planning regulations in place in the case study areas).

Bournville

Bournville is a planned model settlement located four miles to the southwest of Birmingham city centre in the UK. Bournville has been argued to be one of the first examples that implemented the principle stressed in Ebenezer Howard's (1898) *Tomorrow a Peaceful Path to Real Reform* (A. R. Bailey & Bryson, 2006). Bournville's history as a 'utopian settlement' is typically traced back to its founder George Cadbury and the Cadbury firms. To flee the unhealthy and crowded conditions in Birmingham city centre, George Cadbury purchased a greenfield site in 1878 to build the new factory. This plot of land, now home to the Cadbury chocolate factory, was ideally situated next to the railway and the canal whilst positioned between the small villages of Selly Oak, Stirchley, and Kings Norton (A. R. Bailey & Bryson, 2007). The site allowed the Cadbury Brothers to promote its image of pure products produced in a healthy environment. But in order to prevent the surrounding area being developed with high-density terraced housing, Cadbury purchased 120 acres adjoining the factory grounds to establish the 'Bournville Building Estate' (Cherry, 1996). The aim of this estate was to:

> "to make it easy for working men to own houses with large gardens secure from the danger of being spoilt either by the building of factories or by interference with the enjoyment of sun, light, and air" (Bournville Building Estate General Particulars cited in A. R. Bailey & Bryson, 2007, p. 93).

In 1895, George Cadbury appointed as principle house designer and estate architect William Alexander Harvey, an aspiring Birmingham architect. Harvey designed the majority of the houses in the Bournville estate which can be often referred to as the 'Bournville Style' (A. R. Bailey & Bryson, 2007; Bryson & Lowe, 2005). The houses designed by Harvey are typically economic with simple design and modest ornamentation: the *Arts and Crafts* style. This style, deriving from William Morris' rebellion against industrialisation and loss of

craftsmanship, can typically be identified by the use of a variety of materials, asymmetric design, traditional construction and craftsmanship, and clarity in the form and structure (Davey, 1995).

In addition to the Arts and Crafts style, gardens, recreational, and open spaces were also a central component of the Bournville ethos. Cadbury believed that placing his workers in a green environment would benefit their physical and mental wellbeing. As such, efforts were made to encourage recreation, especially gardening, into the development of the Bournville estate. For example, 80% of property land must be for gardening and 10% of the original village was reserved for green space (A. R. Bailey & Bryson, 2007). Even after Cadbury's death in 1922, large open lands continued to be purchased and turned into recreational grounds. Rowheath, for example, was turned into football and hockey pitches with a running track and a Pavilion designed in accordance with Cadbury's plans. As seen in Figure 4.1, Bournville remains a predominantly green area which vast areas of parkland, woods, and grass verges. Thus, Bournville verdant appearance remains a key aspect of the area's character.

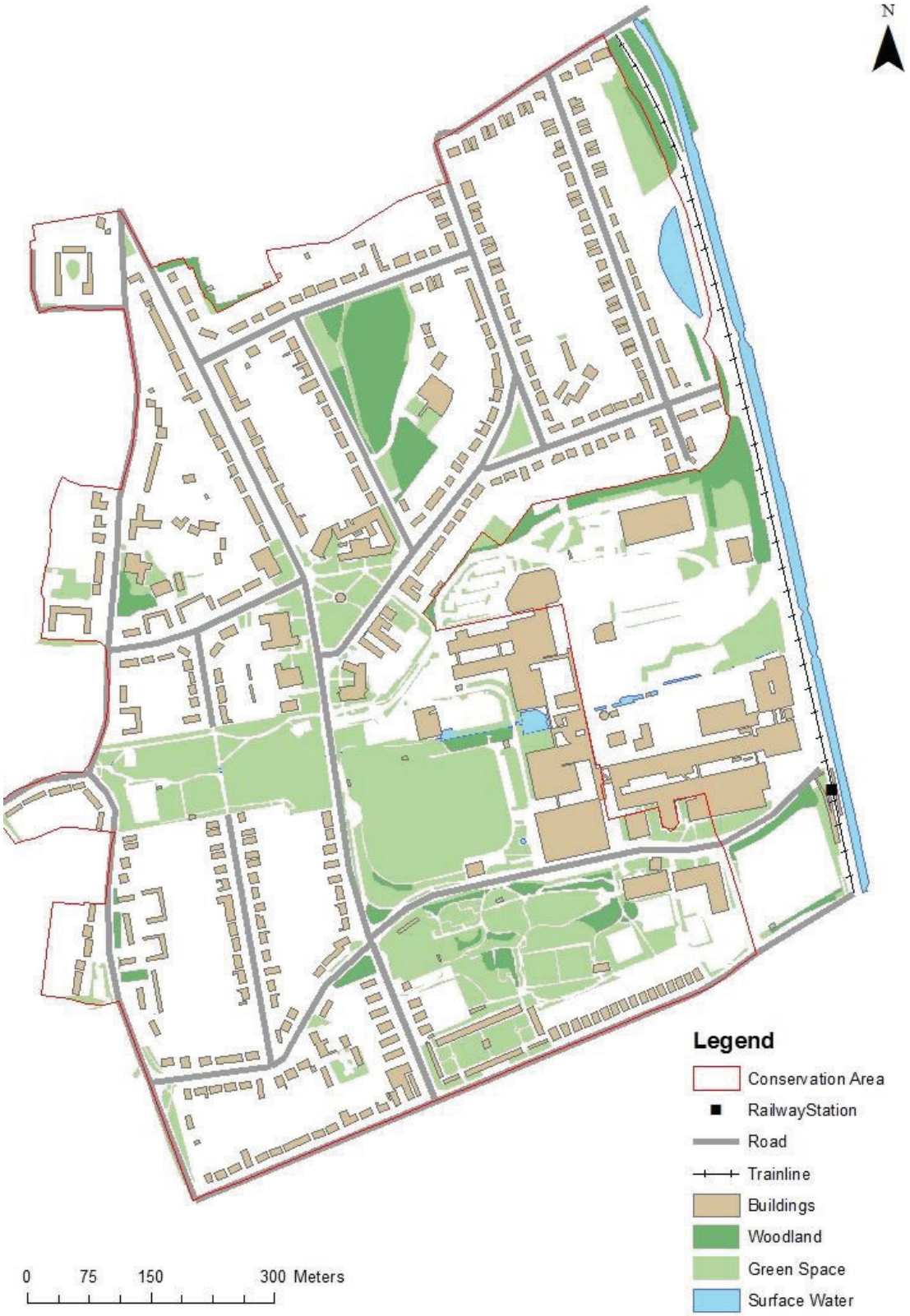


Figure 4.1: Detailed map of the Bournville Conservation Area (source: author's own, derived from Ordinance Survey Mastermap)

Following the development of the Bournville Estate, George Cadbury become concerned about the future of the estate following his eventual death. To prevent speculative building work, Cadbury transferred his ownership to a charitable trust, the BVT, who was responsible for the "amelioration of the condition of the working class and labouring populations … by the provision of improved dwellings, with gardens and open spaces" and "of securing to the workers in factories some of the advantages of outdoor village life" (W. A. Harvey, 1906, p. 9). Today the BVT is still a key actor in the area and has influence over 1,000 acres (Figure 4.3) with approximately 8,000 mixed tenure providing homes for about 25,000 people (Bournville Village Trust, 2016). These properties are all subject to the BVT's 'Design Guide', which prevents residents from altering their properties away from the Bournville village aesthetics in order to maintain "the unique character and historical significance" of Bournville (Bournville Village Trust, 2018, p. 5). These controls also work alongside the Birmingham City Council's planning restrictions in the urban conservation area situated in the heart of Bournville (Figure 4.2). The Bournville Village Conservation area was originally designated by the City Council in June 1971 to help protect the essential character of the Bournville Village Estate. The area is under 'Article 4 Direction' which means that certain alterations to properties, such as replacement of windows, extensions, and satellite dishes, would require consent from BCC and the BVT (Birmingham City Council, 1994).

The unique nature of Bournville, however, has meant that it has been subject to numerous academic analyses including its architecture and development (Atkins, 1989; Bryson & Lowe, 2005; Cherry, 1996), ethos and ideology (A. R. Bailey & Bryson, 2007; Bryson & Lowe, 1996), social mixes (A. R. Bailey & Bryson, 2006; Sarkissian & Heine, 1978), and photographical studies (Booth et al., 2013). As demonstrated in Figures 4.2 and 4.3, Bournville can be interpreted in three different ways: as the electoral ward, the BVT area, or the 'Bournville Village' (or conservation area). Whilst this study concentrated on the Bournville Conservation area (Figure 4.2), most of the participants tended to walk beyond these boundaries and explore more of the Bournville ward and the BVT area (Figure 4.3).

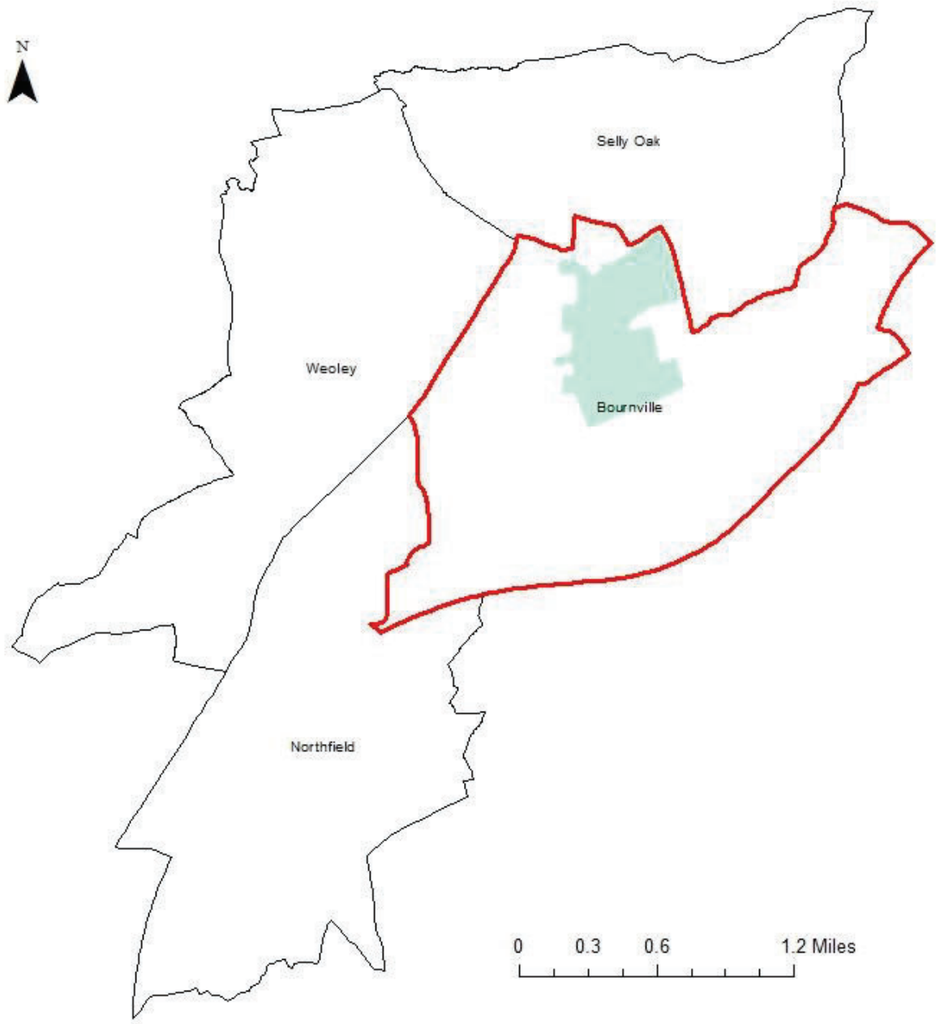


Figure 4.2: Bournville Conservation Area

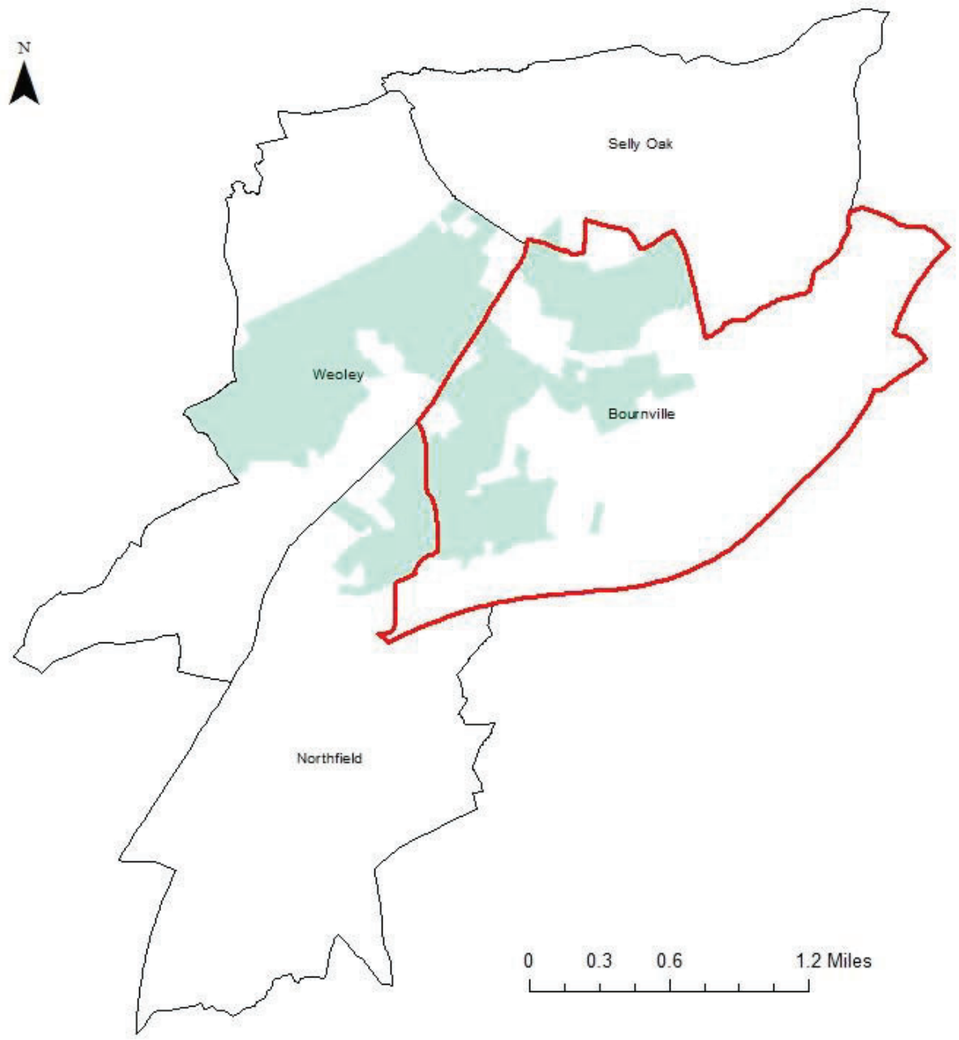


Figure 4.3: Bournville Village Trust Area

Moseley

Moseley is also a suburb of Birmingham but has a longer history than that of Bournville. Dating back to the time of the Domesday Book, Moseley grew as a small hamlet to a village and then into a suburban settlement (Fairn, 2004). Moseley and the surrounding areas were much developed after 1910, being built upon the once extensive farm land that was predominant in this area. The new properties being mostly of large houses, designed to cater for the Edwardian middle-class families that settled in the suburbs surrounding Birmingham's industrial centre. These large houses are in a wide variety of architectural styles including Arts and Crafts, Victorian villas, and three-storey Edwardian residences.

In some respects, Moseley and the surrounding area suffered a serious decline in the last part of the 20th century. Much property fell into neglect, and problems with crime, drugs and prostitution became commonplace in the areas bordering Balsall Heath (P. Jones et al., 2017). During this same period, however, with a great deal of cheap accommodation on offer, it is arguable that Moseley also enjoyed its most creative and cosmopolitan phase as the focus of artistic and student communities (Fairn, 2004). The area has since gentrified and is now one of the more affluent suburbs in Birmingham, although parts of north Moseley continue to suffer from deprivation.

Figure 4.4: Moseley Farmers Market in the 'Moseley Village' (from Moseley Farmers Market, 2019, n.p.)

The area has a mixture of residential properties, with some streets being among the most expensive in the city and others consisting largely of social housing and other rented accommodation. Despite being a major suburb, the area still maintains its 'village feel' and the focal point of the 'green' in an area informally known as 'Moseley Village' (Figure 4.4). This is the heart of Moseley and is home to various shops, pubs, cafes and restaurants. The two conservation areas of Moseley (Figure 4.5) include these expensive and larger residential properties reflecting the affluence of the area.

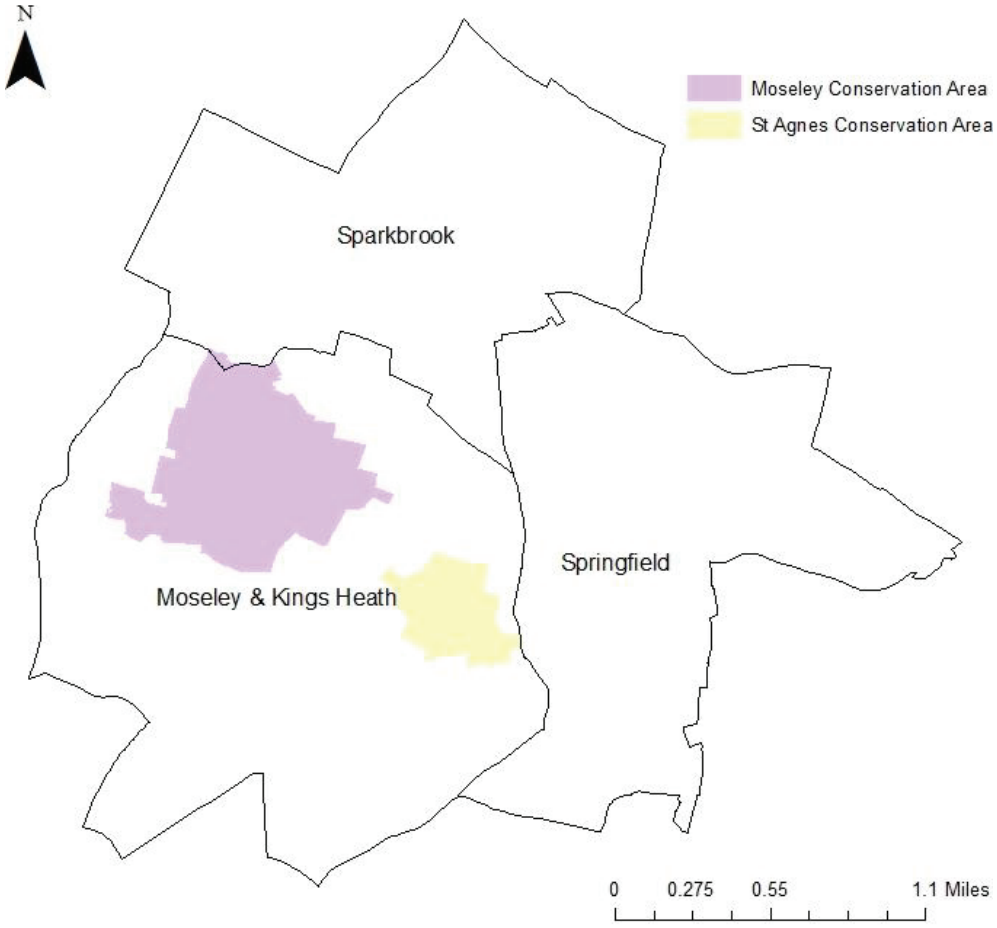


Figure 4.5: Conservation areas of Moseley (after Birmingham City Council, 2017).

The first, Moseley Conservation Area, was designated in 1983 and covers an area of approximately 52 hectares (Figure 4.5). Starting originally as a small village centred around St Mary's Church, increased building work began in Moseley in the 1870s following the development of the railway through the area. By 1904 major works on the road network in and around Birmingham had begun. Consequently, Salisbury Road in the heart of Moseley

became the main route in and out of the city (Fairn, 2004). Additionally, Moseley was incorporated into the Birmingham City boundary in 1911 and officially became a suburb of the city. During the interwar war years, Moseley continued to develop and expand towards the west city before slowing down in the post war period with the rise of small flat complexes. These identifiable periods of development are reflected in the five distinctive architectural styles and areas still found in the area:

- The historic hamlet of Moseley Village including St Mary's Church and the village green.
- 18th Century grand houses such as Moseley Hall (now Moseley Hall Hospital) and its grounds, which are now parkland.
- The large Victorian houses built following the development of the railway.
- The modest late 19th century and Edwardian houses found in the southern areas of Moseley.
- The interwar and post-war developments, namely small complexes of flats typically found at road junctions.

Just like in Bournville, the Moseley Conservation Area Management Plan (Figure 4.6) was designed to preserve the unique character of Moseley but also to manage change and development that may impact upon the historic environment. Figure 4.7, on the other hand, is primarily a residential area. This area contains many substantial residences built in a range of designs and styles. Figure 4.7 indicates that the size of the house plots in the area and St Agnes' Church as a focal point for the area. Francis Willmot, a local solicitor and the developer of the area, donated the land on which the Grade II listed St Agnes' Church is situated (BCC, n.d.). The church is built in the decorated gothic style and dominates the landscape. The area has been largely unaltered since its development in the 1890s, and consequently is another example of the Arts and Crafts design. Indeed, William Alexander Harvey designed 25 and 27 St Agnes Road, which are now two of the listed buildings in this conservation area.

Figure 4.6: Detailed map of the Moseley Conservation Area (source: author's own, derived from Ordinance Survey Mastermap)

Figure 4.7: Detailed map of the St Agnes Conservation Area (source: author's own, derived from Ordinance Survey Mastermap).

In addition to these two conservation areas, there are several green open spaces in and around the area including the private Moseley Park and Pool, Cannon Hill Park, Moseley Bog, and Highbury Park. Each of these parks are very different, for example Moseley Park was originally a major part of the gardens of the Moseley Hall[69] estate but in 2006 became under management of a Charitable Trust who preserve and manage the park. Access to the park, however, requires membership at £45 a year to financially support the park and to "maintain a safe and secure environment" (Moseley Park, 2016). Highbury Park was originally part of the Highbury Hall estate. The Highbury estate was home to the Chamberlain family until Joseph Chamberlain's[70] death in 1914. This *rus in urbe*[71] estate covered over 100 acres and was named after Joseph Chamberlain's childhood home of Highbury, north London. The Chamberlain family were interested in agriculture and gardening, and traces of these practices can still be seen the landscape today. Following Joseph Chamberlain's death, however, the hall became a military hospital and the grounds became a public park in 1930. Whilst Highbury Hall Park is not strictly a conservation area, the residents of Moseley saw it as a key aspect of the area's history. As such, it was included in the case study area alongside St Agnes and Moseley conservation areas and forms a major part of Chapter 8.

Jewellery Quarter

The Jewellery Quarter is a historic industrial area located north east of Birmingham's city centre, which covers an area of just over 90 hectares (Figure 4.8), with an approximate population of 3,000 people (P. Jones et al., 2015; Wesener, 2016). The Jewellery Quarter has a rich history involving different waves of development, which have created a varied collection of architecture and urban design patterns. Starting as a Georgian residential suburb, the Jewellery Quarter developed into a clustering of small companies that specialised in the manufacturing of jewellery (and other small metal items) (Cattell et al., 2002). Since the 1920s the jewellery trade significantly declined (De Propris & Wei, 2007)

[69] Moseley Hall is a Grade II listed house, which was given to the City of Birmingham to use as a children's care home by the Cadbury family in 1891. It is now an NHS hospital dedicated to brain injury and stroke rehabilitation.

[70] Joseph Chamberlain was a British politician who served as mayor of Birmingham and leader of the opposition in the House of Commons who introduced many measures to increase the quality of life in Birmingham by creating parks, roads, schools, museums and improved housing (Marsh, 1994).

[71] Translating as 'country in the city', *rus en urbe* is a term to describe the illusion of the countryside in the city created through gardening or landscaping.

and modernist urban planning principles were adopted, although these were only partially implemented (J. Cattell et al., 2002). For example, the 'Big Peg' building replaced a Victorian block in the centre of the area (Wesener, 2016).

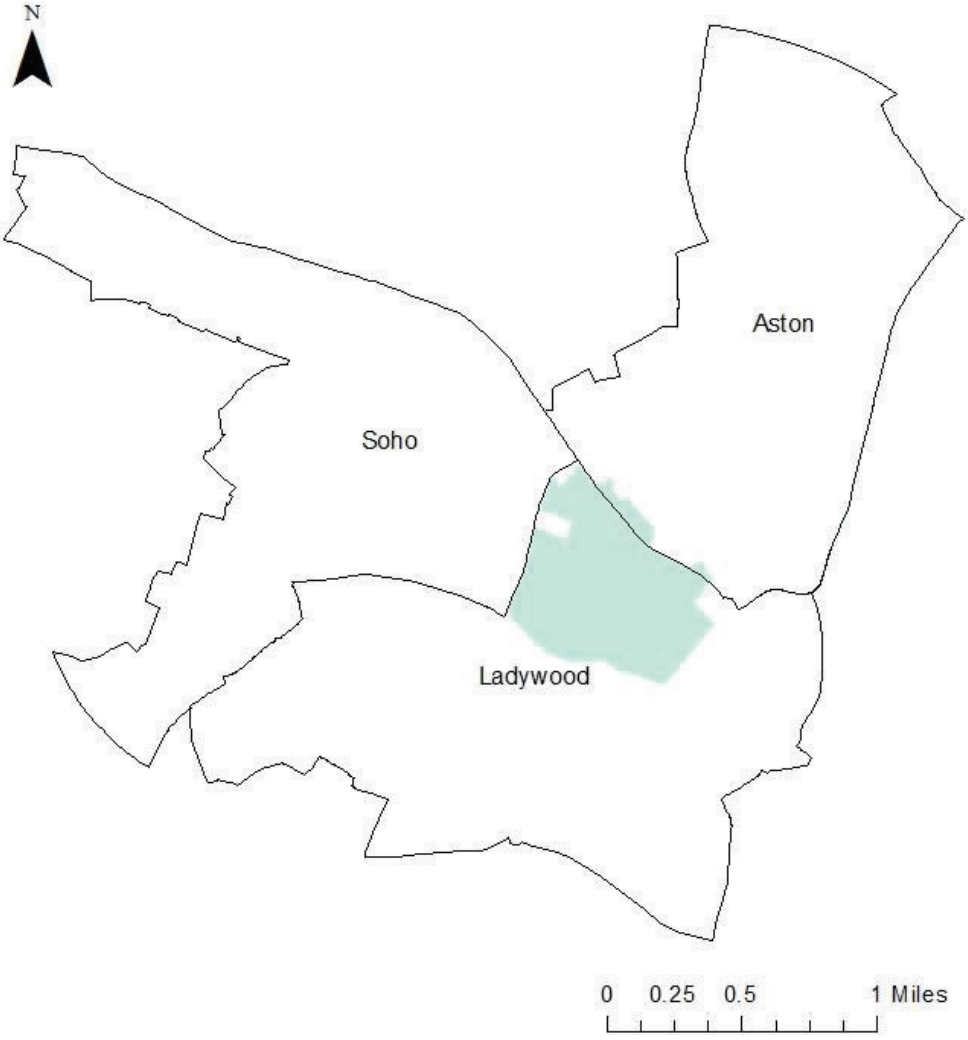


Figure 4.8: Jewellery Quarter Conservation area (after Birmingham City Council, 2000).

In recent years, however, the Jewellery Quarter was declared an industrial improvement area, and two conservation areas were established (BCC, 2000). Consequently, new urban plans and designs have attempted to strike a balance between historic conservation and accommodating new developments (Pollard, 2007). As such, the Jewellery Quarter is a mix of contemporary developments and residential conversions beside historic buildings with the highest density of creative industries in Birmingham, with significant signs of gentrification (Aboutorabi & Wesener, 2009; Holyoak, 2010; P. Jones et al., 2015; Wesener, 2016).

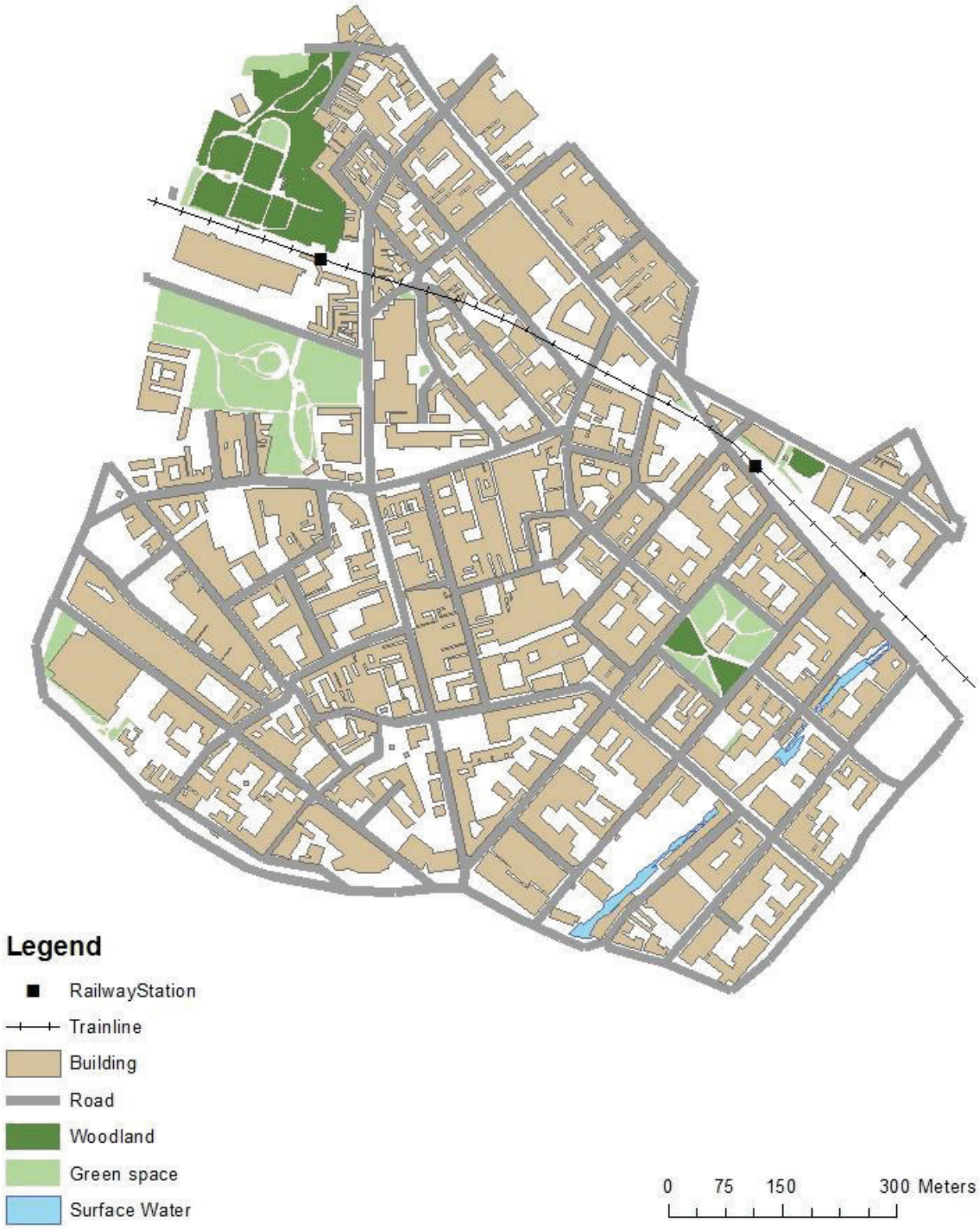


Figure 4.9: Detailed map of the Jewellery Quarter area (source: author's own, derived from Ordinance Survey Mastermap).

An aspect of this gentrification is the large cache of historic properties that have been redeveloped into apartments, residential blocks, and independent commercial business premises. As demonstrated by Table 4.2, there are many Georgian and Regency buildings and even more Victorian and Edwardian buildings, making up 41.2% of the total stock.

Consequently, Blackswan (2013) argues that two-four storey brick Victorian and Edwardian buildings form the unique character of the Jewellery Quarter. And as Figure 4.9 shows, the Jewellery Quarter has significantly less green and open space compared to Moseley and Bournville. Consequently, the Jewellery Quarter has more of an industrial feel than that of Moseley and Bournville, which are more suburban. Nevertheless, the Jewellery Quarter area is a rich historical landscape with over two hundred statutory listed buildings and various museums celebrating the area's industrial past including the Pen Museum, the Coffin Works, and the Museum of the Jewellery Quarter among others (Jewellery Quarter Heritage, 2018).

Table 4.2: Property Age and Use in Jewellery Quarter (Blackswan, 2013, p. 18).

Age Category	**Sample**	**Used**	**Vacant**	**Derelict**
2008-2013	12	12	0	0
2000s	47	45	2	0
80s or 90s	73	72	1	0
Post-War -1979	112	95	13	4
Inter-war	74	58	9	3
Georgian or Regency	303	248	28	22
Victorian or Edwardian	115	95	19	0
Total	736	565	72	29

One of the major features of the Jewellery Quarter are in the two Grade II listed cemeteries: Warstone Lane Cemetery and Key Hill Cemetery. Warstone Lane (shown as the green space south of the train station in Figure 4.9) was the Anglican cemetery and was designed in Gothic style. Its catacombs, as a circular two-decker burial ground in the centre of the cemetery, are a major feature of the cemetery and is the final resting place of famous Birmingham industrialists including John Baskerville (JQDT, 2017). Key Hill Cemetery, conversely, was the non-conformist cemetery and has a different feel entirely. The whole cemetery is tree covered and was left neglected for many years. Whilst volunteers have now began restoring the cemetery, the greenery of the space has attracted a wide variety of wildlife. It also contains catacombs and influential figures including Joseph Chamberlain and the Tolkien family plot (JQDT, 2017).[72]

[72] J. R. R. Tolkien is not buried in this plot but in a cemetery in Oxford.

4.3 CONCLUSION

Bournville, Moseley, and the Jewellery Quarter are three of the thirty designated conservation of Birmingham (Birmingham City Council, 2019a) and therefore bound to the same planning and building laws. This chapter, however, has shown that these areas is different in their history, material/physical environment, and populations, all of which will be shown to shape the psychophysiological reactions of their residents. Bournville, firstly is still heavily influenced by the vision of George Cadbury with large open green spaces, a powerful BVT maintaining the area's buildings, and dominant art-and-crafts architectural style, whereas the Jewellery Quarter is predominately industrial, with a collection of old buildings falling into disrepair, with very little green space, yet has been shown to be a thriving area as a result of its authenticity (Wesener, 2016). By contextualising the study within the three case areas and Birmingham more broadly, it has been shown how the various social, political, and historical contexts shape the three case study areas and their residents. Understanding these social, political, material, and historical contexts provides a context for the following discussion into the key aspects of an urban conservation area: the body-environment, memory, and heritage (discussed in the following chapter).

As such, this chapter provides the context for the empirical findings, highlighting some of the unique features of the area that make these areas so important to the residents and visitors, as well as the participants of this study. Furthermore, it has shown how histories, heritage policies, and the physical/material environments of Bournville, Moseley, and the Jewellery Quarter all exert their own influences on the residents and their connection(s) with their local area and the (living) heritage sites situated there. Thus, the following chapter will discuss the existing literatures on people's connections with the physical/material environment of the cityscape, (the spaces of) their memories, and heritage more broadly.

5

DISSECTING URBAN CONSERVATION AREAS

Conservation areas are "areas of special architectural or historic interest, the character or appearance of which it is desirable to preserve or enhance" (Planning Act of 1990, sec. 69) designated by Local Authorities for the benefit and enjoyment of residents and visitors. Across the UK there are many different kinds including whole residential settlements (e.g. Osmotherley, North Yorkshire), parks (e.g. Priory Park, Warwickshire), and urban areas (e.g. Bournville, Moseley, and the Jewellery Quarter). These spaces are valued for their unique heritage-rich character which could include the physical environment, the historic structures, or the intangible significance of the place. As such, these conservation areas are an amalgamation other various features (including memory, physical/material environment, and, crucially, heritage) and influenced by various actors (including residents, visitors/tourists, and planners). At the onset, however, it is important to stress that heritage is not a direct study of the past; instead it is an aspect of the past which is valued by the present. This definition is deliberately vague because heritage scholars have argued that the concept of heritage has always developed and changed according to the contemporary societal, cultural and political contexts. For example, Larkham (1995, p. 85) has suggested that heritage is simply "all things to all people". However, all individuals and groups are different; therefore, the management and maintenance of heritage can create problems as to which artefact or tradition to preserve.

The management and maintenance of heritage sites is especially an issue in urban areas since urban heritage is the interpretation of history by a wide range of different users. The value

ascribed to urban heritage is not simply the historic attributes and spatialities of the built fabric and the landscape, but also in the life and sense of belonging of its residents. Whilst the questions of 'whose heritage is it' and 'for whom has the heritage been created' are the two dilemmas resulting from heritage conservation - this is especially prominent in urban areas due the diverse population. Additionally, in the urban context especially, there is an added dispute between the need to preserve the past and the need for development in response to social need. These conflicts arise from a sense of romantic nostalgia that stems from a psychological need to root oneself in the past that varies from person to person (Lowenthal, 2015). Urban conservational planning, therefore, aims to strike a balance between preserving heritage whilst enhancing the material/physical environment to ensure it is a desirable place to live by "setting the individual person 'into place' and the insecurity of the infinite space and time, and relating him or her to a culture" (P. Maguire, 1982, p. 23). As the previous chapter has shown, urban conservation areas encompass many of the key areas of this thesis including memory, heritage, the physical environment, and emotion. This is not to say that non-heritage areas are not infused with emotion and memory, but it is more explicit in urban conservation areas.

Following on from the discussion of Bournville, Moseley, and the Jewellery Quarter, this chapter has a dual purpose: it examines the existing literature on key topics that arose from Chapter 4, which in turn, shape the subsequent empirical discussions (Chapters 6 – 8) with each section in this chapter providing a context for the following chapter. Thus, this chapter provides the conceptual context for the thesis through its discussions on the body-city relationship, memory and nostalgia, and (living) heritage. The first section considers the relationships between people and the built environment and therefore underlies the other sections. Through a discussion on urban stress, restoration and the concept of therapeutic landscapes, "*5.1 Understanding the Body-City Relationship*" considers some of the interrelations between the body and its milieu. This section, consequently, supports Chapter 6, which uses the therapeutic landscape matrix to explore some of the psychophysiological responses of the participants. The following section (*5.2 Memory & Nostalgia*) then looks specifically at the individual and how their past experiences (i.e. memories) shape their emotional bonds with their surroundings – directly supporting Chapter 7's discussion on personal and collective nostalgia. The final section of this chapter (*5.3 Living Heritage*), which provides the conceptual basis for Chapter 8, considers the notion of living heritage, a term used to describe heritage sites which are homes for the current population (such as the

three case-study sites) but also sites which blur the distinction between natural and cultural heritage (such as historical parks).[73] Since living heritage is a relatively under-researched area in heritage studies and geography, this section suggests a few theories (namely cultural landscapes, the Freudian uncanny, and (opposition to) heritage industry[74] to help evaluate these complex types of heritage.

5.1 UNDERSTANDING THE BODY-CITY RELATIONSHIP

Cities are complex socio-cultural, economic, political, and biophysical systems with "roiling maelstroms of affect" (Thrift, 2004, p. 57) and emotional ties. All aspects of the city environment influence the bodies of the city dwellers whether that is the stress induced by being on a crowded high street or the soothing qualities of an urban park. This section unpicks the body-city relationship with an emphasis on the city's effect on the body. There is a growing concern for the future for the psychological, neurological and social implications of city living (Abbott, 2012; Adli, 2011; Lederbogen et al., 2011). It is frequently argued that cities are stressful environments to engage with (Abbott, 2012; Adli, 2011; Bilotta & Evans, 2013; Brighenti & Pavoni, 2019; Glass & Singer, 1972), however there is a large amount of literature that demonstrates the restorative powers of green space and nature in cities (Bowler et al., 2010b; Kaplan & Kaplan, 1989; Little, 2015; Ulrich et al., 1991). This section first introduces the ways that living and being in a city can have a negative, or stressful, effect on the body-subject before discussing the ways natural spaces such as green or blue space have been understood to be restorative. This section then closes with a discussion on therapeutic landscape theories, demonstrating how they can be re-appropriated to examine both the restorative and stressful aspects of a landscape.

[73] Living heritage can also refer to heritage practices, such as dance, language, or performance that are practiced by people in the present day. These forms of heritage, however, are more frequently referred to as intangible heritage (Munjeri, 2004; Wanda George, 2010).

[74] Whilst 'opposition to the heritage industry' is not a theory per se, it is a useful way of considering the complexities of living heritage spaces.

Urban stressors

Stress, as the surplus of emotional or mental pressure which exceeds personal resources, is a common and multifaceted feature of modern life (Brighenti & Pavoni, 2019). In recent years there has been an increasing interest in urban stress and mental health across the social and natural sciences which has considered the impact of various social, political, economic, and environmental factors upon the city dweller's stress levels and mental health (Abbott, 2012; Adli et al., 2017; Fitzgerald et al., 2016; Lederbogen et al., 2011). The notion that the city is a harsh and unpredictable environment was famously discussed by Georg Simmel in his key essay '*The Metropolis and Mental Life'* ([1905] 1971) where he argued that the mass collection of bodies, objects and buildings cause the numbing of people's emotions in regard to their surroundings. More contemporary studies (such as neurourbanism and neuroarchitecture), however, have demonstrated how various aspects of the built environment, including materialities, the sensorium,[75] and light among others, have an (often negative) effect on embodied and affective emotional states of city dwellers which is not limited to numbing (see, for example, Adli et al., 2017; Fitzgerald et al., 2016; Frankenhuis et al., 2016; Pallasmaa, 2013; Pykett, 2015).

This is not to say that stress is a solely negative phenomenon since, from an evolutionary sense, it helps humankind to survive with the activation of the 'fight-or-flight' mechanism and respond to the threat effectively (Goldstein & Kopin, 2007). The issue with urban stress, however, is that the stress response can endure for hours, days, weeks or even longer rather than being an immediate response (Abbott, 2012) and urban stresses can be outside of the optimal range of stimulation due to being unavoidable and plentiful in nature and therefore can be considered difficult to cope with (Frankenhuis et al., 2016). The stress model in Figure 5.1, for example, shows that an individual's perception or experience of the environment is the combination of evaluating the physical environment and the subjective characteristics and experiences of the perceiver (e.g. previous experience, adaptive capabilities, and temporality) (Pacione, 2003). Simply, Figure 5.1 shows that an individual will be subject to stress if the perceived environment is outside the individual's optimal range.[76] And if the individual is unable to cope with this stress, they will be subject to poor

[75] The sensorium a term to describe a person's sensory faculties as a whole.

[76] Factors outside the optimal range include over-stimulation, stressors and shocks, and agency restricting factors - see Simmel (1971) and Benjamin (1999)

wellbeing. If the attempted coping strategies are successful, on the other hand, the individual will be able to regulate their emotional response better in the future (Pacione, 2003).

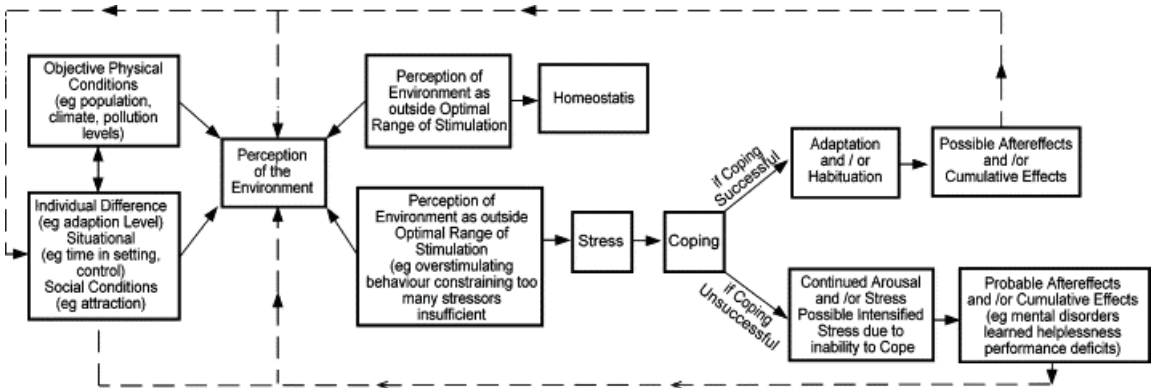


Figure 5.1: A stress model of urban impact (from Pacione, 2003, p. 25).

Whilst there have been efforts to tackle urban stress especially in relation to architecture and the physical environment (Adli et al., 2017; Ellard, 2015; Pallasmaa, 2013), there are still chronic and uncontrollable environmental stressors that are more likely to produce negative feelings and emotions (at a physiological level) (Bilotta & Evans, 2013; G. Park & Evans, 2016). Indeed, harsh and unpredictable environmental stressors, such as crowding and noise (discussed in Chapter 6), have the capacity to have a major impact on the psychophysiological responses of the city dweller precisely because they are uncontrollable. It is important to note that there are also a variety of social factors that have been reported as key urban stressors such as discrimination (Doshi, 2013; Mirpuri et al., In Press), social isolation and loneliness (Lauder et al., 2006; Steptoe et al., 2004), aggression and violence (Dickerson et al., 2009; Kuo & Sullivan, 2001) among others. The implications of these social stressors have been heavily discussed within many disciplines including psychology, geography, neuroscience, and sociology. As such, Chapter 6 will look at social stressors along the environmental and symbolic, or imaginary, stressors and as well as the features that can restore or relax the individual.

Urban restoration

In a bid to counter the stressful aspects of the city, much research has focused on the restorative qualities of the city – namely the effects of urban green and blue spaces. Research in the field of environmental perception has often shown that people in a number of different cultures have similar visual preferences for natural environments over urban environments

(S. de Bell et al., 2017; Li et al., 2011; Maas, 2008; Milligan & Bingley, 2007; Van den Berg et al., 2010). These studies that have focussed on the anxiety-reducing effects of visual exposure to natural environments offer fledging support for the notion that there may be a physiological basis for the preference for natural environments. The restorative effects of green space have generally been explained from an evolutionary perspective. Indeed, what most of these explanations have in common is the argument that, from a remnant of two or three million years of evolution in natural environments, modern humans have developed a genetic readiness to respond positively to habitable settings that were favourable to well-being and survival for pre-modern people (Appleton, 1996; Kaplan & Kaplan, 1982, 1989; Ulrich, 1979, 1993). Notably, this readiness to respond positively to habitable settings is assumed to be triggered by natural environments alone; humans do not possess such a disposition for most built environments and materials (Ulrich, 1993).

An important implication of people's readiness to respond positively to nature is that their attention is easily and almost effortlessly held by natural scenes.[77] This attention-drawing quality of natural settings is referred to as 'soft fascination' (Kaplan & Kaplan, 1989), which is assumed to play an important role in the restorative quality of nature. When nature captures people's attention, executive systems that regulate directed attention are allowed to rest, pessimistic thoughts are blocked, and negative emotions are replaced by positive ones. Indeed, many scholars have commented upon the power of urban spaces being able to attract through a logic of inclusion, pleasure, and desire (Allen, 2006; Degen, 2008). This contingency appears to work in both directions; the presence of natural elements tends to increase liking for (Getz et al., 1982) and foster positive emotions (Roberts et al., 2019). As well as inducing positive emotional reaction, it has shown both within and outside geographic scholarship how these natural spaces can be seen as therapeutic landscapes.

Therapeutic landscapes

The term therapeutic landscapes was developed by Wilbert Gesler (1992), drawing upon theories in cultural ecology, structuralism and humanism, to explore why certain

[77] It is important to note that 'natural' is a complex term to refer to phenomena that is not made or caused my humankind (Gregory et al., 2011). However, the apparent 'natural' scenes used in these studies (such as parkland) are often manmade. As such, this thesis will use the term 'green space' when referring to these types of spaces.

environments and places contribute to a 'healing sense of place' (ibid., 2003). These therapeutic landscapes are spaces "where the physical and built environments, social conditions and human perceptions combine to produce an atmosphere which is conducive to healing" (Gesler, 1996, p. 96). Gesler (1992) identified three overlapping elements of a 'therapeutic landscape': the physical environments, social environments, and symbolic environments (Figure 5.2). Using this understanding of therapeutic landscapes, he investigated places that were clearly dedicated to health and healing including Epidauros (Gesler, 1993), Lourdes (Gesler, 1996), and Bath (Gesler, 1998).

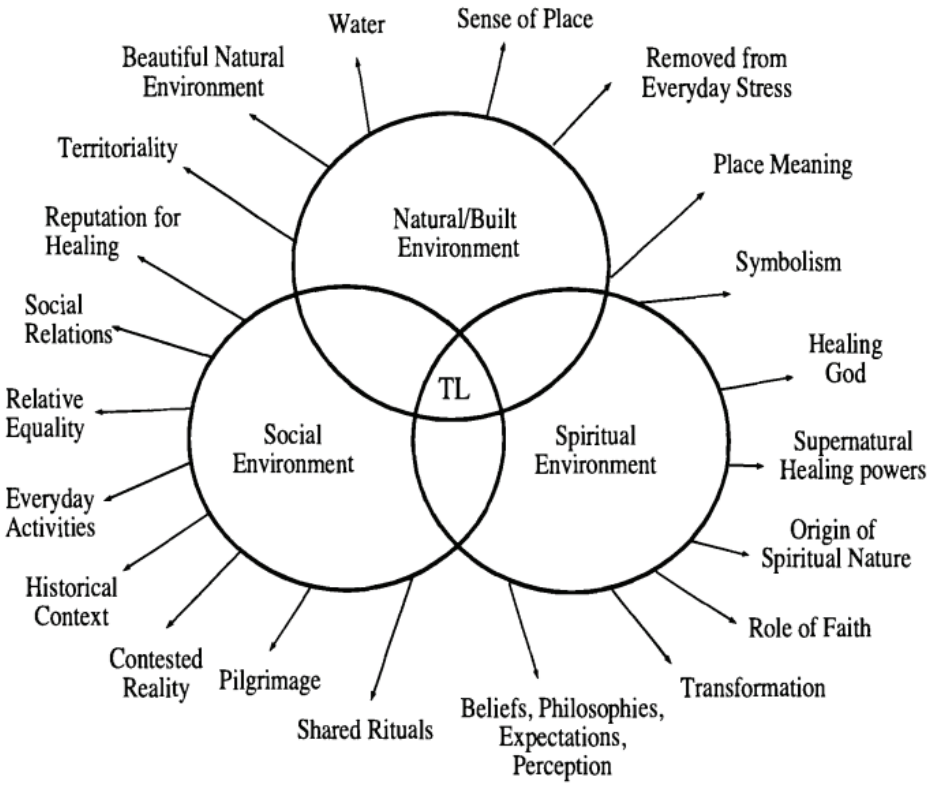


Figure 5.2: Visual representation of Gesler's triad of environments for a therapeutic landscape (from Khachatourians, 2006, p. 42).

Gesler's work (as well as others who had adopted his understanding), however, assumes a link between the places and their therapeutic qualities/capabilities/capacities. Consolidating Gelser's conception of therapeutic landscapes, geographers in this field have been examining how these apparent therapeutic places and spaces work to provide and encourage health and wellbeing for a variety of people, including children and schools (Kearns & Collins, 2000), people with health conditions (Meijering et al., 2017), and in relation to

different ethnicities (Wendt & Gone, 2012), to demonstrate how certain features (such as surveillance, arts, different colour palettes) contribute to the therapeutic nature of a space (see, S. L. Bell et al., 2018 for a review of these findings). This emphasis on different groups of people however demonstrates that they are very much differential. Indeed, David Conradson (2005, p. 338) argued (and demonstrated) how therapeutic landscapes are "best approached as a relational outcome, as something that emerges through a complex set of transactions between a person and their broader socio-environmental setting". Since then there has been a number of works within health geography that has built upon this relational approach and developed new approaches and notions including 'therapeutic assemblage' (Foley, 2011), 'therapeutic mobilities' (Gattrell, 2013; Maddrell, 2011), 'therapeutic networks' (Smyth, 2005), and 'therapeutic taskscapes' (Dunkley, 2009). Thus, it is clear that the term therapeutic landscapes is continually evolving and developing from its emerging ambiguities and contestations (S. L. Bell et al., 2018; A. Williams, 2007). Bell et al's (2018) recent review of studies of therapeutic landscapes clearly demonstrates how it remains an active and self-critical field of research within (health) geography. Indeed, it has been shown both by Bell et al. (2018) and other review pieces (see, for example, A. Williams, 2007) how the therapeutic landscape concept has been particularly useful for geographers to critically investigate the diverse embodied experiences and the various complexities that underpin therapeutic person-place encounters.

Developing upon the two-dimensional matrix

Therapeutic landscape literature has identified and explored some of both the salutogenetic and pathogenetic qualities of a landscape which depend not only on the physical environment but also people's subjective experience of space (Collins & Kearns, 2007; Gesler & Curtis, 2007; Milligan, 2007; Smyth, 2005). As such, the concept of a therapeutic landscape and the approaches to investigating them can be reproduced to investigate both the health-enhancing/restorative and health-limiting/stressful aspects of landscapes. Völker & Kistemann (2011), for example, undertook a meta-analysis of (anglo-, franco-, and germophone) academic studies academic studies across the social sciences looking into blue space and well-being and combined their findings with the theories of therapeutic landsacpes to develop a two-dimensional matrix of therapeutic spaces for analysing the salutogenetic health effects of blue space (Figure 5.3). This framework, which has been used subsequently to effectively analyse the health benefits of blue space in Cologne and Düsseldorf (Völker

& Kistemann, 2013, 2015), comprises of appropriative dimensions of place (namely experienced, symbolic, activity, and social) and ontological dimensions of substantialities (naturalistic, built, humanistic, and structuralist - cf. Claßen & Kistemann, 2010; Gesler, 1992)

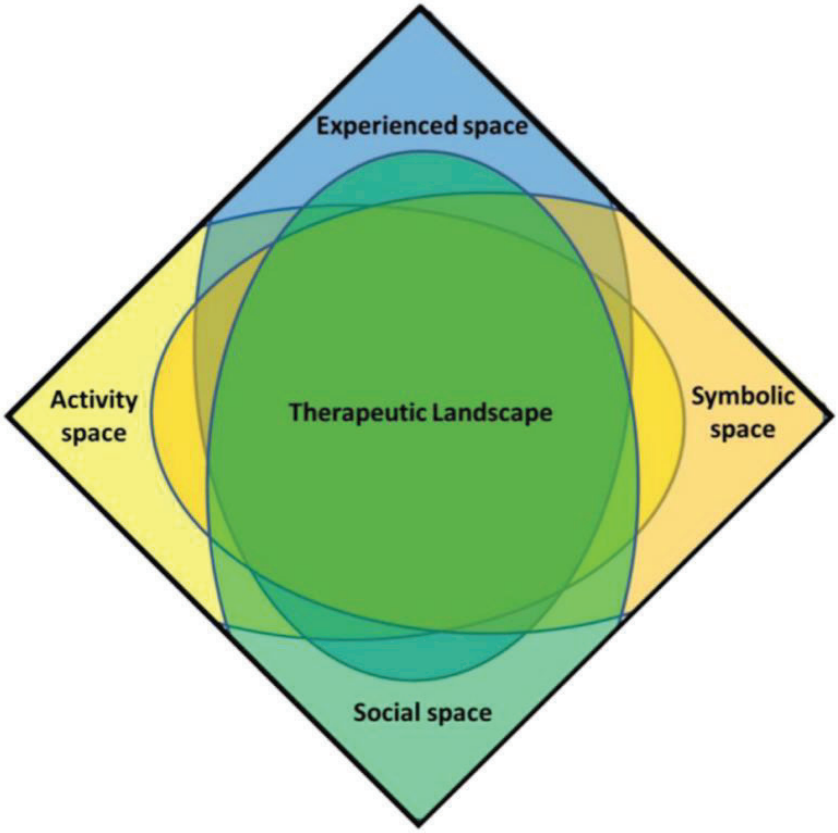


Figure 5.3: Matrix of therapeutic landscapes (from Völker & Kistemann, 2015, p. 197).

Whilst the matrix was developed for blue space analysis, it can be applied to a variety of spaces. Indeed, Völker and Kistemann (2011, p. 458) even notzd that it may "prove worthwhile for wider applications". Chapter 6 of this thesis consolidates on Völker and Kistemann's approach directly by using their matrix of therapeutic landscapes (Figure 5.3) to investigate the various features of the environment that evoke both positive and negative psychophysiological reactions by looking at each aspect of the matrix in turn. Rath

To bridge environmental, psychological, and geographical approaches to space, I develop the two-dimensional matrix of therapeutic spaces coined by Völker and Kistemann (2011, p. 457; also see Kistemann, 2016). But rather than following Völker and Kistemann's matrix

precisely, in my model activity and social spaces have been combined because the participants did not engage actively with the space aside from walking through them (Table 5.1). They did, however, observe others actively engaging with the space which aligns with the properties of the social dimension.

Table 5.1: Dimensions of appropriation of therapeutic landscapes for analysing the restorative qualities of blue space (developed from Völker & Kistemann, 2011, 2013, 2015).

Dimension of appropriation	Properties
Experienced	▪ Sensory perception (Namely: vision, haptics, olfactics, gustatory, and audition)[78] ▪ Micro-climates and atmospheric properties
Social activity	▪ Social engagement and participation ▪ Behaviour ▪ Leisure activities
Symbolic	▪ Spiritual and religious connections ▪ Emotional significance ▪ Identities ▪ Atmosphere

Following Völker and Kistemann's (2011) original matrix, the different dimensions of therapeutic landscapes are understood as:

- ***Experienced***: The first dimension implies a content-based enhancement, particularly concerning human sensory perception of the physical environment. The physical environment is a collection of sensuous qualia which are perceived through the inter-linked processes of sensory experience and (non)cognitive interpretations in the cognitivist embodied subject (De Fazio, 2011; Lévi-Strauss, 1973). This dimension, therefore, focuses on the blue space as a physical landscape, since geographers tend to "move away from viewing place as a physical landscape, and towards a relational view in which space is implicated as human activity or vice versa" (Allison Williams, 2002, p. 148).

[78] Taste is not applicable to this study since the participants did not eat or drink from the environment.

- ***Symbolic***: It is important not to focus solely on the physical landscape, because there are situated and relational perspectives that are dependent on socio-cultural contexts (Strang, 2004). To account for these relational interpretations and imaginaries, Völker and Kistemann (2011, 2013, 2015) built upon Gesler's (1991) conception of 'spiritual space' in the development of the symbolic dimension. Rather than just focusing on the religious aspects,[79] however, Völker and Kistemann (2015) also considered the importance of emotional significance, spatial and personal identities, and the atmosphere of space; thus incorporating the subjective imaginaries and attachments to the framework. As such, symbolic space can be used to incorporate geographic theorisations of atmosphere (e.g. B. Anderson, 2009) but also the older, cultural-geographic work on landscapes (cf. D. Mitchell, 1995; Sauer, 2007).
- ***Social Activity***: Whilst none of the participants actively engaged with the space (i.e. jogging or swimming), Völker and Kistemann (2011) also include passive recreational activities (e.g. nature observation and walking), which may not be immersive but are supported by, or linked to, the space within their conceptual framework. Thus, the combination of social and activity spaces considers the sites of sociability and face-to-face interaction through active engagement with the space, which can either be recreational or simply being involved with the social flows in a given space.

By combining activity and social spaces, the dimensions of appropriation can be paralleled with Lefebvre's (1991) trailectics of spatiality. This Lefebvrian perspective, considering a trio of objective (*percu*), conceived (*concu*), and lived (*vecu*) qualities of space, has been used by geographers in their theorisations of space (Merrifield, 1993; Pierce & Martin, 2015; Soja, 1996). This enthusiasm within geographic literature, however, is not without critical engagement or unease. Indeed, some scholars have noted that Lefebvre's work is littered with unelaborated nuances and references (Dale, 2005; Hernes, 2004). For instance there is an acknowledged ambiguity concerning the relationship between lived space and the notions of conceived and perceived spaces (Hernes, 2004; Shields, 1999), with the latter pair formulated as direct correspondences of Descartes' *res cognitans* [Latin: I think] and *res*

[79] Religious aspects include "symbolism, a healing god, supernatural healing powers, the origin of a spiritual nature, the role of faith, transformation, and beliefs, philosophies, expectations and perceptions" (Völker & Kistemann, 2011, p. 457).

exensa [Latin: I am], the former (later argued to be) situated between the two (Elden, 2004). Whilst all these aspects do make up a space, Lefebvre did not address in detail the overlapping features of objective and conceived space. This is not to disregard Lefebvre's trailectics of space, but instead to adopt a framework that does not limit the spatial dimensions within themselves. Indeed, one aspect of the environment can cover several dimensions simultaneously; therefore, the dimensions are not limited to themselves but can coincide with the others.

In this discussion of therapeutic landscapes, it has been shown how the concept is limited by its lack of empirical engagement with wide-ranging dimensions suggested by the concept (cf. Figure 5.2), including the important historical, cultural, and fundamentally subjective factors influencing the diversities of people's encounters with place over time. And whilst Chapter 6 will explore many of these health-enhancing/restorative and health-limiting/stressful aspects of landscapes, there still remains an opportunity to see how memory, as one of these subjective factors, influences people-place relations. Furthermore, there has been a call for methodological pluralism "that combine evocative experiential narratives with more tangible physiological and psychological measures" (S. L. Bell et al., 2018, p. 129) within the therapeutic landscape frameworks to resonate with public health policy makers and audience but also enhance our knowledge on person-place relationships.

5.2 MEMORY & NOSTALGIA

As the previous section has shown, historical, cultural and subjective factors influence people's encounters with place. As such, it is important to consider the role that people's past experiences have on their perception of their environments, or in other words, their memories in and of place. Memory is not a single process of retrieval in the self, but a set of complex and interrelated processes. The many geographers who have engaged with memory have shown how memories are established in the bodily and emotional experiences of being

and moving in space (Edensor, 2005b; Hebbert, 2005; O. Jones, 2011; Muzaini, 2015; Rose-Redwood, Alderman, & Azaryahu, 2008). As O. Jones (2011, p. 875) argues:

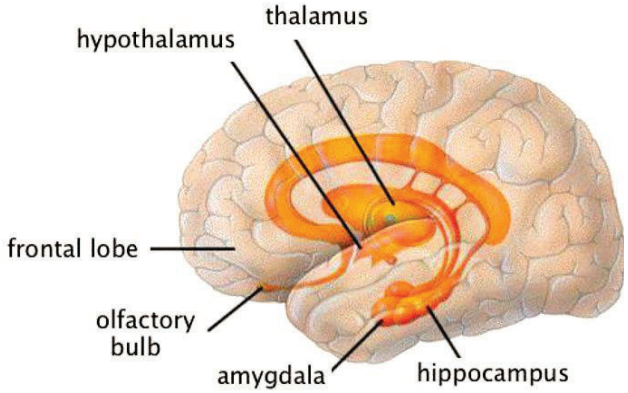
> "Memory makes us what we are, and, along with emotion/affect, forms the interrelating foundational processes of our ongoing lives … We are conglomerations of past everyday experiences, including their spatial textures and affective registers"

Correspondingly, space acts as a 'theatre of memory' (cf. "Lieux de mémoire" - Nora, 1989) where phenomena (both virtual and material) from different epochs converge, where "the landscape becomes a juxtaposition of asynchronous moments where space forms a container for different eras producing a depthless world where time as process is erased" (Crang & Travlou, 2001, p. 161). Furthermore, it has been shown within geography (and the cognitive sciences) how memory and emotion are deeply entwined at an embodied level (Bhatti et al., 2009; Gallagher, 2006) and have the capacity to stir a physiological response(s) in body (LeDoux, 2000; T. Osborne, 2019). This section will discuss the recent work on nostalgia within geography and the relationship between space and nostalgia, but first it will examine the relationship between memory and emotion from a biosocial perspective. As such, it will focus on the roles and processes of nostalgia to consider some of the emotional complexities of remembering. Nostalgia, as a type of memory, is an example of a bittersweet phenomenon that combines the feelings of contentment with feelings of loss.

Memory & emotion

Memory is a prime example of a biosocial phenomenon; the events remembered are more-often-than-not a *social* event yet also a biological phenomenon that arises from the neurological circuits of the body. The brain's limbic lobe (Figure 5.4), which is referred to as the 'feeling and reacting brain' and is responsible for our 'animalistic' impulses and responses (LeDoux, 2000), is of particular interest when discussing memory. The various elements of the limbic system have been shown within the cognitive sciences to have strong links to memory, emotion, and stimulation of the body (via the automatic nervous system) (Barr, 2015; Catani et al., 2013; Hariri et al., 2000; LeDoux, 2000). For example, the recollection of intensely emotional experiences (either positive or negative) occurs as a result of the relationship between the amygdala and the hippocampus. When an individual is subject to a deeply emotional experience, the amygdala (emotional centre – cf. Figure 5.4) sends a neural impulse to the hippocampus to the prefrontal cortex, which forms a new

episodic memory (Barr, 2015). Crucially, when this experience is recalled, the neural connections are reactivated, including the perception of the emotion including the activation of the automatic nervous system via the thalamus and the hypothalamus.



Element	Role
Amygdala	As the emotional centre of the brain, the amygdala evaluates the emotional valence of situations and stimulates the fight-or-flight response.
Hippocampus	Whilst the precise role is disputed, the hippocampus has been shown to play a major role in the formation of memories.
Thalamus & hypothalamus	Combined the thalamus and the hypothalamus relay and stimulate impulses to and from the automatic central nervous system.
Cingulate gyrus	The cingulate gyrus is responsible for emotional processing and vocalisation (cf. W. James, 1884). Additionally, it can link sensory stimuli (such as smell) with emotive memories.
Olfactory bulb	The processing of smell.

Figure 5.4: The Limbic Lobe and the roles of the various elements (after Arbib, 2013; LeDoux, 2000)

Clearly, the emotional and mnemonic neural circuits are interlinked. But it is problematic to focus solely on the neurological processes of memory because the memory-making and reminiscing are always bound to social, cultural, and environmental circumstances (Katz & Peters, 2008, p. 351). Instead, there is a space to interpret the socially and biology of memory in tandem since they are explicitly linked. Within geography, it could be argued that the non-representational theorists (see, for example, DeSilvey, 2012; O. Jones, 2015) have

considered the practice and process of memory at a bodily and pre-cognitive level, but the biological factors of memory are yet to be fully incorporated into geographical inquiry despite calls to do so:

> "There is much to be considered within the interrelationships between individual memory (that which is practised with the neural networks of the individual), and what is variously called public, social, cultural or collective memory" (O. Jones & Garde-Hansen, 2012, p. 6).

Thus, the processes of memory (including processing, retrieval, and (re)actions) arise from a continuous reciprocal causation between the neurological/biological and social body and the environment.

For example, Owain Jones (2015), in his autobiographic account of his family's move from South Wales to a farm near Bath (both UK), reminisces about playing on the wheat sacks in the harvested fields, late-teen romances, and going away to boarding school and comments on the emotionality of losing his childhood home because of a Compulsory Purchase Order:[80] "The landscape of the old farm still haunts me. Its loss pains me greatly … Perhaps the place itself was my refuge. I don't really remember it as events – but as material spaces" (O. Jones, 2015, p. 20). As such, Jones' focusses on the sense of loss – both in terms of the physical environment from his childhood, but as a time that has gone and can never be retrieved. Crucially, however, when Jones (virtually) returned to his childhood home (via Google Street View) he found:

> "its geography completely erased, apart from a few trees and, strangely, a fragment of garden wall, near where my mother used to sit in the sun. *My body reacts each time I read through this sentence* as I struggle to finish the paper" (O. Jones, 2015, p. 24- emphasis added).

This quote demonstrates that when reminiscing occurs, particularly when it is an emotional experience, there is a physiological (re)action. The use of biosensing technologies to measure these physiological responses to memory allows us to investigate those typically nonconscious somatic reactions. Therefore, the use of these technologies responds to the recent call for more 'viscerally-aware' research practices in the social sciences, which

[80] A Compulsory Purchase Order (CPO) is when the government acquires land without the owner's consent for a given scheme, such as a new road or building estate. A CPO is only approved when the proposal is in the community's best interest or financially important.

include investigating "the felt sense of the internal organs of the body, such as our hearts beating in our chests, or a basic form of emotional response to a situation" (Ash, 2017, p. 206; Sexton et al., 2017).

Nostalgia

Owain Jones' (2015) autoethnographic account and emotion reaction is also an example of a nostalgia because it demonstrates the differing emotional effects of remembering his lost childhood home whilst emphasising the embodied nature of recall. Indeed, the term nostalgia comes from the Greek for home and painful longing (*nostos* and *algos,* respectively) (Boym, 2001) and therefore is embroiled with emotional undertones. The term typically refers to a geographical and/or temporal distance; a longing to be where we once were (or where we want to be). Bonnett (2016) argues, however, that the spatial dimension has been eroded, consequently nostalgia is considered in conjunction with the temporal rather than the spatial. Yet, what would happen if the spatial elements of nostalgia were stressed, or as Jennifer Ladino argues:

> "What if we stopped privileging temporality and began to map nostalgia, to follow its widening courses and plot its particular trajectories? I believe re-placing nostalgia in this way renders the object of longing more tangible and opens up new possibilities for how nostalgia might function" (Ladino, 2012 in Bonnett, 2016, p. 2).

As a deadening home-sickness or melancholy, nostalgia has developed multiple, typically derogatory cultural and political meanings (Atia & Davies, 2010; Scanlan, 2005). Additionally, these arguments are often accompanied by a notion that nostalgia and memory differ, with the latter assumed as a superior and rational phenomenon (Bonnett & Alexander, 2013). As such it is argued that nostalgia "leads to a negative and disappointed sense of the present imbued with a blame culture, a celebration of the past and fatalism about the future" (Watson & Wells, 2005, p. 23).

It is this emotive capacity, however, that enables nostalgia that gives the future relevance (Boym, 2001; Legg, 2004). Recent work within geography on nostalgia supports this argument; Adams and Larkham (2015) and Bonnett and Alexander (2013), for example, use the narratives from (ex-)residents of a city to demonstrate how nostalgias can be used to

benefit both present and future. Outside of geography, nostalgia has been shown to be a multifaceted and progressive process. For example, Cheung et al. (2013) examining nostalgia from a psychological viewpoint, have demonstrated how nostalgia is a strong feeling of loss and yearning as well as a sense of optimism and social connectedness. This optimistic and forward-facing nostalgia, what Alison Blunt terms 'productive nostalgia' is "embodied and enacted in practice rather than solely in narrative or imagination" and "orientated towards the present and the future as well as towards the past" (Blunt, 2003, pp. 717 & 722; also see C. Seremetakis, 1994).

The stress on the embodied and enacted practice of nostalgia has been demonstrated in recent literature on the 'more than representational' (Lorimer, 2005). Tim Edensor (2012, p. 1114) in his attempt to examine the mingling of emotion, affect, and atmosphere at Blackpool Illuminations, found that the visitor interviews were "often saturated with emotional resonances, particularly of nostalgia and notions of continuity" and stresses the importance of the nostalgic and sensuous engagement with a space, especially in the coproduction of an atmosphere. Moreover, work by Monica Degen and Gillian Rose (2012; 2010) on memories and the senses demonstrated how the residents' forgotten memories were stirred in very sensuous and pre-cognitive ways. These examples of research, therefore, demonstrate how individual nostalgias are a combination of cognitive and affective perceptions. As such the embodied and enacted practice of nostalgia is "capable of stimulating recollections of the material environment that might have been consciously relegated to history; here memory has the ability to 'strike back'" (D. Adams & Larkham, 2015, p. 2010), or to quote Muzaini, "memory returns" (2015, p. 102). Consequently, a study of nostalgia is able to consider the relations between the emotive, the temporal and the spatial.

Place & nostalgia

Accepting that memories and nostalgia are brought forth through bodily engagements with the world, many geographers have demonstrated how the landscape itself can play an important role in evoking the past (Crang & Travlou, 2001; D. C. Harvey, 2015; Hill, 2013; Hoelscher & Alderman, 2004; Ingold, 1993). Indeed, as Ingold argues "to perceive landscape is … to carry out an act of remembrance", that such acts of remembering are not "a matter of calling upon an internal image, stored in the mind", but arise through being and

engaging with "an environment that is itself pregnant with the past" (Ingold, 1993, pp. 152–153). The romantic nature of nostalgia, however, has resulted in its continued unsympathetic understanding and interpretation the humanities, who view the phenomenon as a regressive and naïve longing for a lost time which acts to work against modernity and progress (D. Adams & Larkham, 2015; Pickering & Keightley, 2006).

As such, nostalgia can be understood as an ideologically exploitable concept; a tool to selectively manipulate the urban environment (D. Adams & Larkham, 2015; Batcho, 2013). A number of commentators have argued that measures are implemented to employ techniques of 'imagineering' to evoke nostalgia for the past and spatialise specific collective memories (Crang & Travlou, 2001; Edensor, 2005b; Kohn, 2012; Massey, 2011; Rose-Redwood et al., 2008; Wesener, 2016). The past is "constantly selected, filtered and restructured in terms set by the questions and necessities of the present" (Jedlowski, 2001 in Edensor, 2005b, p. 830); within this selective past, questions of belonging arise: *whose* past is it and *for whom* has it been re-imagined/vitalised? Therefore, the identity of places is very much bound up with the histories, which are told of them, how those histories are told, and which history turns out to be dominant.

The role of spaces in the processes of memory have been well documented within geography (Blunt, 2003; Crang & Travlou, 2001; Degen & Rose, 2012; Edensor, 2005a, 2005b; Hebbert, 2005; Hill, 2013; Hoelscher & Alderman, 2004; J. Horton & Kraftl, 2006; O. Jones, 2011). Additionally, neuroscientists have demonstrated the importance of space in memory creation and retrieval, from navigation skills (Maguire et al., 1997) to episodic memory formation (Todd & Bucci, 2015). In the majority of this work is an acknowledgement that the past is a selective and geographical construction. In other words, these authors argue that memories (re)emerge from people's decisions and actions that are embedded in the environment.

Urban areas, in particular, are often seen as an arena that houses a variety of epochs both within the materiality of the city, but also the layers of social and cultural practices and

performances written into the landscape (Crang & Travlou, 2001).[81] Indeed, the urban fabric is argued to be "the transformation of the time of progress into the space of seemingly meaningless juxtapositions" (D. Roberts, 1988, p. 554). This interpretation of the urban fabric as a patchwork of time not only stressed the juxtaposition of different eras, but also different urban textures and styles:

> "a period of stylistic stasis, a period characterized not by linear, cumulative development of a single fundamental style, but the coexistence of a multiplicity of quite different styles in a fluctuating and dynamic steady-state" (D. Roberts, 1988, p. 556).

In a cityscape, therefore, people stroll across unordered, superimposed, and contrasting time-moments, as such the city street is rich with spatial and temporal layers. There is a large body of literature that have examined 'urban memory' (D. Adams & Larkham, 2015; Bonnett & Alexander, 2013; Crinson, 2005; Hebbert, 2005; Kohn, 2012) since cities serve as powerful and multifaceted containers of memory, both at a collective and individual level. As such, an investigation into urban memory(scapes) provides a way of "accessing how various strata of society and different communities construct the metropolitan world" (Srinivas, 2001 in Rose-Redwood et al., 2008, p. 162). This implies, however, that urban memory is polyvocal, mixing personal individual memories and nostalgias and (created) collective memories which often encompassed under the term 'heritage'.

5.3 LIVING HERITAGE; OR LIVING WITH HERITAGE

Hitherto this chapter has considered the roles that the physical environment and memory have in a person's relationship with their surroundings. Urban heritage conservation, such as that in Bournville, Moseley and the Jewellery Quarter, is the common-sense combination

[81] This is not to disregard work on rural memories. There is a collection of work concentrating on rurality (see, for example, DeSilvey, 2010; Lorimer, 2012; Macpherson, 2009a, 2009b). This body of literature, however, is overshadowed by the sheer quantity of literature of urban memories. Whilst this project does not consider rural memories, there may be scope to pursue further research in this area.

of the two in that it considers the role(s) of memory within a landscape. The case study areas, however, differ from traditional concepts of 'heritage' which often refer to places/objects that are heavily preserved to the extent that they are 'frozen in time' (Lowenthal, 1998). Instead, the case study sites for this investigation are examples of 'living heritage': spaces that rich with history but are very much alive, either through the population living and working there, or the natural processes that continue to (re)shape the landscape. By focusing on living heritage, this thesis moves towards a biosocial notion of heritage which questions the distinction between natural and cultural heritage which is common in heritage policy and literature (see, for example, UNESCO, 2005).[82]

Living heritage thus aligns with Lowenthal's (1998) argument that heritage is not exclusively about the past, but a living construct used to contextualise the present. Although Lowenthal's argument is in relation to the concept of heritage rather than features of heritage; the importance of past in the present is apparent in heritage exhibitions. For example, museums regularly incorporate hands-on and interactive exhibition spaces and there is an increasingly number of 'living history' museums, both of which demonstrate how heritage is becoming increasingly 'alive' (Ramshaw, 2010) These interactive and 'living' exhibits in museums, however, are examples of when social memories are externalised through commodification and mediatisation (cf. Edensor, 2005a). As such, they are often preserved or recreated for a purpose (such as financial gain) rather than being at one with the modern world. Consequently, this thesis focuses on those historical features that are part of and form the everyday. For sure, they are a part of the conservation areas and therefore preserved, but not mediatised and fossilised as such.

This section first introduces the main two conceptions of living heritage considered in this thesis: areas or spaces of heritage where people live and work and heritage sites that bridge the distinction between natural and cultural heritage. This section closes with a discussion of some of the theoretical lens that can be used to understand such features – namely cultural landscapes, the Freudian uncanny, and (opposition to) the heritage industry. Consequently, this discussion on biosocial and living heritage feeds directly into Chapter 8 which discusses two types of living heritage, ruins and historical parks, and the different attachments that people have to them.

[82] UNESCO stands for United Nations Educational, Scientific and Cultural Organisation.

Living in heritage

Traditionally the study of heritage has tended to focus on conservation and the effect(s) of tourism (but not exclusively - cf. Waterton & Watson, 2015b) because safeguarding tangible heritage has for a long period been one of the most significant aspects of conservational policy (B. T. Hoffman, 2006; Lähdesmäki, 2016; Ross, 1996). Consequently, studies on heritage have tended to be undertaken by archaeologists, art historians, and architects (D. C. Harvey, 2001; Waterton & Watson, 2015a). Although there is still a strong interest in tangible heritage, there has been a shift towards broader notions of heritage by geographers (and other social scientists), which include unrepresentational and emotional relations (L. Smith & Campbell, 2016; Tolia-Kelly et al., 2016), intangible forms of heritage (L. Smith & Akagawa, 2008; Wanda George, 2010), and the politics (of identity) (S. McDowell, 2016; Whelan, 2016). Within geographical scholarship, 'heritage' often denotes two sets of related meanings: sites with a historical theme (including cultural landscapes and tourist sites)[83] and a suite of shared cultural values expressed through performance (Graham et al., 2016; Johnson, 2015; Peckham, 2003).[84] From this work, Johnson (2015, p. 163) argues that three interrelated approaches to understanding heritage have been developed in the discipline: "(a) heritage is a form of inauthentic history displayed in space; (b) heritage is primarily part of a process of tourism expansion and postmodern patterns of consumption and; (c) heritage is a contemporary manifestation of a longer historical process whereby human societies actively cultivate a social memory".

But even with the increasing number of heritage sites and areas that have a resident population (such as urban conservation areas), there is little consideration in geography and heritage studies of: how these residents undertake their everyday lives these protected spaces; their (emotional) connections with the area and its heritage; and their possible conflicts with heritage policy and sharing the space with frequent visitors. It can be argued, therefore, that the opinions and needs of those living within heritage may be omitted for tourism and conservation. Indeed, most research on local resident's links to heritage nearly always in reference to either tourism or conservation (see, for example, Chen & Chen,

[83] Cultural landscapes will be discussed in detail later in the chapter.

[84] The list includes, among other things: handicrafts, oral traditions and languages, the performing arts (including music and song), and cinematographic heritage (UNESCO, 2008).

2010b; Fiallo & Jacobson, 1995; Jaafar et al., 2015; Zhao et al., 2016). Despite this overlooked area of heritage in academia, policy-makers have acknowledged that spaces and sites of heritage do have residents and begun to use the term 'living heritage' (DCMS, 2017; UK Government, 2019; UNESCO, 2013), even though it does not have a clear definition.[85] At risk of oversimplifying the term, this study understands living heritage as an area or site of heritage that is maintained or enriched by having a population residing it in. Living heritage enriches an area by literately bring life to a space so explicitly tied to the past, but living heritage is complex and leads to (sometimes) testing relationships between the local people and the authorities who manage the site. Indeed, it will be discussed how some Bournvillians struggle with the rules that the BVT impose on them. Because while it has been argued that the involvement of the local community aids the conservation and celebration of heritage (Lowenthal, 1998), there are concerns around balancing the needs of the local people which are often regarded as conflicting with the protection of the sites (Baillie, 2013)

One major study on a 'living heritage' site was undertaken by anthropologist Keiko Miura (2004, 2005, 2006, 2011b, 2011a, 2011c), who has written extensively on Angkor Wat, Cambodia, paying particular interest on the everyday lives of the villagers. Although the UNESCO regards the site as a living heritage site as a result of the ~70,000 people living there (UNESCO, 2011), the concept, again, is not clearly defined. Indeed, Miura stresses that there is no clear definition for the term and in regard to Angkor Watt, the term is often related to the religious practices in the site, "while other aspects of living are under or little discussed" (ibid., 2004, p. 19). Throughout Miura's work, she argues that the religious aspects of life cannot be separated from everyday practice, working towards an understanding of how living heritage residents accommodate for and experience living in a space rich with heritage.

[85] Augusto Villalón (UNESCO World Heritage Committee member), for example, commented that the ancestral houses in Tana Traja, Indonesia, are living heritage: "They go beyond the sense of "home" being regarded as living symbols of local families who insist on maintaining their religious, cultural and environmental traditions" (Villalón cited in K. M. Adams, 2003, p. 92). Whereas Takaki and Shimotsuma (2003) suggested that tourism, religion and national moments can be considered living heritage in a village without residents.

Just like the residents of Angkor Wat, the participants in this study (who either live or work in Bournville, Moseley or the Jewellery Quarter) can be argued to be members of a living heritage site. Indeed, one of the unique qualities of Bournville is that it was designed *for* its population, not the tourists who visit the area every year. Yet, as Miura's work shows, the everyday experiences of people living in these living heritage sites are often disregarded both in policy and in academic scholarship. Thus, there is an opportunity to explore this aspect of living heritage to explore what makes these areas so special for the people closest to them. Indeed, it has been argued that heritage can only be sustained by a living community in the site (Lowenthal, 1998; Miura, 2005; Takaki & Shimotsuma, 2003).

Heritage that is alive

As iterated earlier, heritage compasses many things and is therefore very difficult to define. Regardless UNESCO produced a list of 'types' of heritage in their authoritative document "Convention Concerning the Protection of the World Cultural and Natural Heritage". In the original World Heritage Convention (1972), world heritage was divided into two broad categories - cultural heritage and natural heritage - but in more recent years the term heritage has begun to incorporate more types of places, objects, and practices to protect both the tangible and intangible through laws and charters.

We receive heritage from two sources – the natural environment and the creations of human beings. Both types of heritage are seen as inheritances that should be held in trust for future generations, yet the conservation policies are quite different with these two kinds of heritage. The most common way of classifying heritage is to distinguish between 'cultural' heritage (manufactured by humans), and 'natural' heritage (not been manufactured by humans) (UNESCO, 2005). While this seems like a fairly clear-cut distinctions, it immediately throws up a series of problems in distinguishing the social values of the natural world and how humankind impact and intervene with 'natural' sites in the name of conservation. Because the natural progression or processes and human efforts to preserve are inextricably linked, the question arises: where does culture begin and nature end, and vice versa? For example, there is a small patch of woodland in Bournville named Stocks Wood. This fenced off area

is (possibly) a relic of the ancient Forest of Arden[86] but is still subject to human intervention. Thus, this patch of woodland is subject to two contradictory examples of care/control: on one hand the wood is kept closed to prevent the need for "tree surgery for safety reasons [and] destroy a significant part of the wood's wildlife value" but on the other hand is subject to "sympathetic and careful husbandry by the Bournville Village Trust [to ensure] that the wood stays natural" (Bournville Village Trust, 2014, n.p.). The two measures simultaneously prohibit and ensure there is human intervention in the space, and thus results in a debatable natural status.

Undeniably human action has shaped and reshaped all elements of nature, but heritage conservationists still consider natural heritage as distinct from cultural heritage. David Lowenthal (2005) suggests that the disparities between the treatment of natural and cultural heritage arises from the otherness of nature. Whilst humans may feel as if they are allied with the nature, most do not project themselves into non-human lives nor have a closeness to nature (cf. Viving, 2003). Cultural heritage, on the other hand, promotes empathy because the ancestral specificity imbues an intangible connection and personal allure. So, whilst there is a love for nature, the majority of people identify with human artefacts and practices and consequently are more likely to rise to its defence when threatened. It is not to say that natural heritage is not conserved - there are over 200 natural sites in the UNESCO World Heritage list; however, most of these sites are protected for long-term economic or ecological benefits. Indeed, the justification for preservation is often linked to protection of food, water, and energy sources and/or generating tourist revenue (Lowenthal, 2005). Despite the disparities in natural and cultural heritage there still remains a clear overlap - nature is ultimately impacted by human agency, and artefacts are influenced by environmental influence.

Theoretical approaches to living heritage

If we understand heritage as a series of properties that emerge from the relations between heterogeneous human and non-human actors over time (cf. Harrison, 2015) it is possible to take a novel approach to heritage. So instead of repeating the arguments against the

[86] The area of Arden, which was located across Warwickshire, Staffordshire, and Worcester, was formerly forested (hence, the name Forest of Arden) but was subject to forest clearing from the 16th Century onwards (Watkins, 1997).

nature/culture binary within heritage policy (see, for example, Harrison, 2015; Lowenthal, 2005; G. P. Marsh, 2003; Rössler, 2002), this section (as well as Chapter 8) stresses the importance of heritage features that are not 'frozen in time' or over-mediated and commodified but very much alive. For this thesis, living heritage is understood as historical spaces/structures that are still in process and are at one with the modern world. A ruin, for example, can be seen as living heritage because it can be understood as both an object ('a ruin') but also a process ('to ruin') and are often juxtaposed with new developments, homes, and social places.

The concept of living heritage is relatively under researched there are some theories already adopted in geography that can be used to unpick these spaces. Namely, the Freudian uncanny (2003b), Sauer's theory of cultural landscapes (2007), and living heritage as opposition to the heritage industry. Indeed, Chapter 8 '*Nature-Culture & Heritage*' will use these theories to discuss the residents' responses to these phenomena.

I. Cultural Landscapes – "Cultural landscape" has been a fundamental concept for geographers since its first use in Germany in the 1890s and early 1900s with the work of Friedrich Ratzel, Otto Schlüter, Franz Boas as an opposition to environmental determinism (M. Jones, 2003; Taylor & Lennon, 2011). Introducing the term to the English-speaking world, Carl Sauer (2007 [1925]) defined the cultural landscape as an area successively altered by humans through their cultural activities and fashioned by particular cultural groups from the natural landscape that preceded human activity. In his famous essay *The Morphology of Landscape* (2007 [1925], p. 63), Sauer argues that:

> "The cultural landscape is fashioned out of a natural landscape by a culture group. Culture is the agent, the natural area is the medium, the cultural landscape is the result. Under the influence of a given culture, itself changing through time, the landscape undergoes development, passing though phases, and probably reaching the end of its cycle of development. With the introduction of a different, that is, alien culture, a rejuvenation of the cultural landscape sets in, or a new landscape is superimposed on remnants of an older one. The natural landscape is if course of fundamental importance, for it supplies the materials out of which the cultural landscape is formed. The shaping force, however, lies in culture itself"

As this quote demonstrates, Sauer understands a cultural landscape as the coexistence of culture and nature within a humanistic ontology (Taylor, 2012). Within a discussion of heritage, therefore, cultural landscapes can be used as a holistic approach to the culture-nature binary relationship (Taylor & Lennon, 2011). Consequently, the term 'cultural landscape' is used within heritage policy to lessen the divide between nature and culture (UNESCO, 2005, 2008). UNESCO, for example, declared three categories, or types, of cultural landscapes which would have universal value within the remit of World Heritage (Table 5.2).

The introduction of cultural landscapes into heritage policy increases awareness that heritage (places or sites) are not secluded but there is an interdependence of people, social structures, and the physical and ecological environments (Taylor & Lennon, 2011). The UNESCO categories, however, have been argued to primarily consider landscapes that are remodelled or created by human agency (cf. category 1 - Table 5.2) or those that are infused with intangible cultural values (cf. category 3 - Table 5.2) (Wu, 2010). Despite being understood as "the interface between nature and culture, tangible and intangible heritage, biological and cultural diversity – [cultural landscapes] represent a closely woven net of relationships, the essence of culture and people's identity" (Rössler, 2006, p. 334), the degree of human interference remains a source of confusion. For example, the term has been used to describe agricultural or rural landscapes in the urban fringe (such as in Chapter 8) but also in reference to all landscapes that are influenced by human action (M. Jones, 2003). Consequently, the usefulness of the term has been questioned since humankind has influenced the vast majority of landscapes globally. Indeed, Phillips (1998, p. 28) has argued that: "since there are cultural aspects to practically every landscape on earth, it follows that practically all landscapes are cultural landscapes".

Table 5.2: The categories and subcategories of UNESCO's understanding of cultural landscapes (UNESCO, 2008, Annex 3).

(1) Clearly defined landscapes designed and intentionally created by man	
(2) Organically evolved landscapes	• A relict (or fossil) landscape is one in which an evolutionary process came to an end at some time in the past, either abruptly or over a period. Its significant distinguishing features are, however, still visible in material form • Continuing landscape is one which retains an active social role in contemporary society closely associated with the traditional way of life, and in which the evolutionary process is still in progress. At the same time, it exhibits significant material evidence of its evolution over time.
(3) Associative cultural landscapes: The inclusion of such landscapes on the World Heritage List is justifiable by virtue of the powerful religious, artistic or cultural associations of the natural element rather than material cultural evidence, which may be insignificant or even absent	

Despite the etymological elusiveness of the term 'cultural landscape', it can still act as "an appropriate bridge between space and society, culture and environment" (Rowntree, 1996, p. 127). As such, the concept of cultural landscapes is useful because of its holistic understanding of the landscape mosaic that contains multiple systems and processes from multi-scaled ecosystems to different degrees of human modification across time.

II. The Uncanny – A second way to understand living heritage sites is the Freudian notion of the Uncanny which derives from the term *unheimlich* [German: 'unhomely'] and refers to an object of aesthetics situated between fantasy and reality (S. Freud, 2003b; Haughton, 2003; Howe, 2010). It is a phenomenon that is both familiar yet unfamiliar and therefore stirs feelings of uncertainty and sometimes fear; it is a "species of the frightening that goes back to what was once well known and had been long familiar" (S. Freud, 2003b, p. 124). Crucially, however, the uncanny does not solely refer to the *unheimlich* phenomenon but also "a felt experience that disturbs the body" that is "a displacement from the everyday [and] simultaneously places us in the midst of the familiar" (Trigg, 2012, p. 27).

Despite originating from psychoanalysis, the theory has been adopted by a range of scholars in different disciplines to investigate the co-mingling of opposites in various forms (Cixous, 1976; Derrida, 1972; Heidegger, 1996; Wittgenstein et al., 1969, among others). Living heritage, as a phenomenon that combines past and present, natural and cultural processes, and the familiar and unfamiliar, is therefore an example of an uncanny. Vidler (1994, p. 12), for example, in his discussion of uncanny architecture argues that it is possible to interpret spaces and buildings using the theory:

> "If there is a premise to be derived from the study of the uncanny in modern culture, it is there is no such thing as an uncanny architecture, but simply architecture that, from time to time and for different purposes, is invested with uncanny qualities".

The uncanny, therefore, not only can be used to understand the features of living heritage, but also the consequential emotional response of witnessing such a phenomenon. Typically witnessing an uncanny is an unpleasant feeling, it can also be used unpick the positive emotional connection people have with living heritage. Cixous (1976), in her reading of Freud's Uncanny, critiques the theory by arguing that the uncanny represents a repressed desire and attraction for the phenomenon, thus:

> "[The Uncanny is b]ased in the disjunction of opposed twins—familiar/unfamiliar, near/far, homely/unhomely—the uncanny circumvents laws of logic, yet at the same time frees itself from the need to be resolved of its paradoxical status. At its genesis, the uncanny takes up residence in the manifold space between experience and thought, perfectly at ease with its ability to invoke repulsion and allure in the subject experiencing the uncanny" (Trigg, 2012, p. 27).

The Uncanny's dual nature and emotional entanglements points to a novel way to unpick the relationships between people and heritage features. Not only is the theory of the uncanny able to explain the various emotion responses to these features, but if also considered along with nostalgia, it can also be used to unpick the longing for homely as opposed to the *un*homely when an individual experiences a feature from the(ir) past which is different from their memories or what they have been told by the heritage industry.

III. Beyond the Heritage Industry – Heritage is often a source of pride for local resources and are often seen as a benefit to the area's local economy through the processes of tourism (Waterton & Watson, 2015b). Indeed, the Association of Leading Visitor Attractions

(ALVA, 2017) have demonstrated that heritage sites receive some of the highest visitor numbers in the UK. Furthermore, Birmingham is increasing promoting the city using its heritage attractions including museums and historic buildings as well as the urban conservation areas (Visit Birmingham, 2018). Despite the (mostly) positive economic impacts of the heritage industry, it is important to reflect on the fact that the historic environment is fragile and sensitive to negative impacts or threats including ownership and, property value (Ashworth, 2002; Wanda George, 2010), authenticity and identity (Lowenthal, 1996; Wesener, 2016), and in relation to the environment, sustainability, and conservation (Barthel-Bouchier, 2016; Coccossis & Parpairis, 1995; Han et al., 2016; Rahman, 2012).

Aside from the impact listed above, heritage sites, as a result of tourism and policy, are arranged and managed to encourage consumption within which place is created but is altered into new meanings: "landscapes of consumption … tend to consume their own contexts [because of the] homogenizing effect on places and cultures" (Sack, 1992, pp. 158–9). Moreover, heritage policy results in the freezing of heritage features (and sometimes areas) in time:

> "Heritage is held to fossilize, to preclude ambivalence, to tolerate no doubts. 'The true product of the heritage-industry is entropy; history is over, nothing more is to be done.' Robert Hewison echoes Nietzsche in warning that fevered nostalgia precludes present action. Turning a blind eye to past turmoil, leaching out past distress and bewilderment, heritage is blamed for stifling enterprise. The penchant for patrimony litters the world with legacies of outworn junk" (Lowenthal, 1998, p. 88).

The heritage industry's processes of fossilisation are perhaps more evident in national parks and heritage sites where the local population are banned for protective purposes (e.g. Stocks Wood discussed previously). Crucially, however, these sites are "'frozen in time' as exotic spectacle[s] for tourist consumption, rather than being allowed to evolve and modernize as an integral and living part of the city [or of any other context]" (Suntikul et al., 2010, p. 210) and therefore can be argued to be divorced from the present environment.

Whilst reflecting on the previous section on memory, it is also possible to argue that the heritage industry represents the externalisation of memory through the processes of commodification. Examples of this commodification of memory is demonstrated through

the mediatisation of popular sites, icons, and myths where memories are materialised outside of the local population, and thus "makes the old (history) into a specific spectacle, as it does with all exoticism and local particularity" (Augé, 1995, p. 110). These commodified memory sites replace the memories that were embedded in the social interactions and everyday habits of the local community and are instead conveyed in and through space (cf. *lieux de mémoire* - Nora, 1989) and thus, separate social processes from the local area and redistributes it across a wider scale: "there are a shrinking number of everyday spaces which do not construct eternal presents, where memory is not discarded from moment to moment" (Stallabrass, 1996, p. 173). The processes, crucially, demonstrate how the heritage industry is significantly linked to the politics of memory in which certain memories are remembered and made apparent, whilst others are left to be forgotten. Typically, the externalised memory sites are remembered for the local businesses, tourists, and middle-class white residents in the area.[87] Since living heritage sites are not exclusively a memory or a story from the past, allows for a certain ambiguity when reading the landscape and can lead to new ways of interpreting the past. These are sites were time cannot be "simply mapped out on space but [is] buried and hidden in the landscape" (Crang & Travlou, 2001, p. 170).

Living heritage sites counter these notions of frozen history and commodified memories precisely because they are still 'alive' and a part of the present. Living heritage sites, such as Angkor, Cambodia (Miura, 2005) or Meteora, Greece (Poulios, 2008), are spaces of heritage that are being used by the local population for their original purpose regardless of tourist practice (Miura, 2005; Takaki & Shimotsuma, 2003). As such, they are sites that of historical significance as a result of the practices of the current population. So, while they may contribute to the heritage industry indirectly, these sites contradict the processes of fossilisation and commodification of the past which is commonplace within heritage policy. Instead, living heritage sites allow for the consideration of spatial practices and change over time whilst considering how the current population is physically, socially, and emotionally embedded within these sites through their engagement with them.

---

[87] It is common for the population of urban conservation areas in the UK to white and middle-class and it is also true for the three case study areas in this study (discussed in detail in the following chapter).

By using Cultural Landscapes, the Uncanny, and the (opposition to) heritage industry to unpick the notion of living heritage it is clear that living heritage bridges a variety of traditional binaries including past/present and nature/culture. Firstly, a cultural landscape is a juxtaposition or layering of different times and, thus, encompasses features "from different epochs [that] bring the past into the present landscape" (Crang & Travlou, 2001, p. 163). Thus, living heritage sites conjure up histories, evoke memories, and also testify to different types of temporalities (such as ecological decay, changes in fashion/culture etc.) whilst being very much present as a part of modern everyday life. Hence, there are a host of juxtaposed and layered "asynchronous moments" which "collide and merge" in a living landscape (Crang & Travlou, 2001, p. 161). These are sites that not solely fossilised as a piece of history but is an active site/feature within the contemporary world.

Furthermore, living heritage demonstrates the "*multiple interacting and collaborating agencies* which can include humans but is never exhausted by them" (Plumwood, 2006, p. 125 - original emphasis). Although the theory of cultural landscapes has been criticised for being monological and privileging the role of human agency, it still identifies that any landscape is a collaboration between natural and cultural actors. Thus, a living heritage site is multitemporal, but also demonstrates the continued interaction of natural and cultural agencies. These multiplex sites will be discussed in relation to a historical park and the various spaces of ruination across the case study areas in Chapter 8 as a way to unpick people's connections with a more informal and everyday type of heritage.

5.4 CONCLUSION

Since this biosocial account of urban conservation areas focuses on the psychophysiological reactions of residents of Bournville, Moseley, and the Jewellery Quarter, this chapter has discussed some of the key aspects that comprise an urban conservation area - the physical environment, memory, and (living) heritage – with each section providing a grounding for the following empirical chapters. In doing so this chapter has considered some of the unique qualities of the urban conservation areas detailed in the previous chapter and considered how

these features have been discussed within and outside geographical scholarship. The initial discussion on the person-environment relationship considered the roles that urban stress and restoration have upon people in the built environment. The concept of therapeutic landscapes, which underpins Chapter 6, was then introduced as a way to identify the various types of spaces and phenomena (including social, experienced, active, and symbolic) that can evoke a psychophysiological reaction from the residents. The subsequent section focused at the scale of the individual by looking at the role of past experiences and memory has regarding people's emotional connection with their surroundings. In order to fully incorporate the complex emotional reactions of recall this chapter has discussed the role that nostalgia has in stimulating a sense of authenticity and emotional attachment that shapes our identities, sense of home, and community (cf. Probyn, 1996). The final section of this chapter provides the theoretical grounding for the final empirical chapter of this thesis which discusses the varied psychophysiological responses to sites of ruination and historical parks. As such, "*5.3 Living Heritage; or Living with Heritage*" went beyond a simple discussion of heritage and conservation to consider some of the complexities in heritage; namely, the consideration of a living population in heritage environments and a heritage that unites the culture-nature binary and considers the past and present structures simultaneously. These notions of 'living heritage' were considered alongside the theories of cultural landscapes and the Uncanny as well as the heritage industry more broadly as a means to dissect and investigate these multifaceted sites, where the participants had varying psychophysiological responses (cf. Chapter 8).

This chapter demonstrates some of the complexities in an urban conservation area that can have influence on a person's psychophysiology which can arise from the physical/material environment, a person's past experiences, and the history of the area. And whilst geographical literature demonstrates that an array of phenomena that lead to (and evolve from) emotions (cf. Chapter 2), this thesis, by focusing on living heritage, allows this study to focus on a surprising gap in the heritage literature whilst also considering the effects of the environment and personal and collective memories. By considering a variety of conceptual areas, this thesis is able to consider how biosocial geography will interpret different areas of geography, but also strive to unpack the complex relations between the residents and their neighbourhoods in the three case study areas.

Having established the theoretical, methodological, and contextual basis for this investigation in the first part of the thesis, the following chapters will develop the biosocial account of the relationship between the body and the urban environment by considering the physical environment, the role of memory, and heritage in turn. As such, the next chapter will begin by considering the various features of these areas that evoke a psychophysiological reaction from the participants through Völker and Kistemann's (2013) therapeutic landscapes matrix. The following chapter will look specifically at the role of nostalgia (both personal and collective) to investigate how past experiences shape people's emotional connections with the areas. Finally, the last empirical chapter will discuss the various and complex psychophysiological reactions to two types of living heritage (ruins and a historical parks) as examples where the population can interact and influence sites.

6

URBAN STRESS & RESTORATION THROUGH THE THERAPEUTIC LANDSCAPES FRAMEWORK: SELECTED PSYCHOPHYSIOLOGICAL RESPONSES.

The urban environment is an amalgamation of different socio-spatial phenomena including bustling high streets, (often congested) roads, plazas, and large parks, and a variety of architectural styles. Not only do these materialities and landscapes affect the ways that people engage with the city, but they also have the capacity to affect the body physically. Previous academic work has argued that urban, 'grey', or human-made environments typically stress the body (Benjamin, 1999a; Brighenti & Pavoni, 2019; Glass & Singer, 1972; Lederbogen et al., 2011; Simmel, 1971) whereas 'natural' environments have restorative qualities and have been linked to improved health and well-being (Barton et al., 2016; Dallimer et al., 2012; Lee & Maheswaran, 2010; Maas et al., 2006). There is a tendency in the literature to separate grey, green, and blue space into distinct categories.[88] In practice, however, these spaces are blurred; for instance, the majority of blue space in the three case study areas were found within green space and roads are often tree-lined. Therefore, the focus of this chapter is not to examine how the spaces as a complete entity (i.e. 'green', 'blue', or 'grey') affect the body, but look at how the micro-spatial features of the environment influence psychophysiological responses. With this focus on the smaller and more complex features of the environment, rather than the spaces as a whole, this

[88] With the exception of blue and green space, especially regarding infrastructure (see, for example, Perini, 2016).

chapter moves beyond simply classifying the spaces in broader categories, towards a geographical understanding of space as a network of human, non-human, and more-than-human flows.

In the majority of environmental psychology literature, spaces are often split into categories: namely urban/grey, natural/green, and water/blue (see, for example, Nutsford, Pearson, Kingham, & Reitsma, 2016; Ulrich et al., 1991; White et al., 2010). Whilst there are major differences between the three types of spaces (with green being 'soft', grey being 'hard', and blue being a differ matter altogether), there are major overlaps between the three. For example, Highbury Park in Moseley contains grey, green, and blue spaces despite not being categorised as a 'natural' space in environmental psychology. However, the participants in this study saw Highbury Park as "an unspoilt area of natural grounds" (interview with Sonya [Moseley resident, Female, 45-54-years-old], 25/11/2016), even though there are a collection of man-made structures in and around the park including three major buildings on the northern perimeter.[89] As such, Highbury Park is not solely a green space, it encompasses a variety of spaces, matter, textures, and structures which combine to form the environment. And there is yet to be an investigation into these micro-spatial spaces, matter, textures, and structures and the various psychophysiological reactions that they have the ability to evoke.

This chapter, therefore, considers the some of the micro-spatial features across Moseley, Bournville, and the Jewellery Quarter. Yet due to the complexity of these environments, I use the phrase 'selected psychophysiological reactions' because it is impossible to discuss all the various psychophysiological triggers in the physical environment. Furthermore, an individual's psychophysiological responses to their surroundings are complex and depend on a variety of factors - not just the content-based experience of the physical environment. Therefore, there is a need to adopt an analytical framework that encompasses the physical, social, and non-representational aspects of space. As such, this chapter develops upon therapeutic landscape theory to explore the psychophysiologically evocative aspects of space. Crucially, however, the biosocial methodology, and the use of biosensing in particular, allows this chapter to identify and discuss the micro-spatial qualities of these

[89] Situated within the park: Uffculme Centre (conference venue), Highbury Hall (a grade II listed mansion), and the Uffculme Special School.

spaces, rather than simply exploring green, blue, and grey space more broadly. This chapter will start with a discussion on experienced space, looking at how sensory stimulation shaped the participant's reception of the spaces they passed through. The following section looks specifically at the socialities of space and how the participants responded to the vitality, or lack of. The final section of the chapter then turns to the notion of symbolic space with a discussion of spirituality, the notion of home, and atmospheres in space. Combined, this chapter explores and discusses some of the specific qualities or features of space that stimulate both health-enhancing or restorative and health-limiting or stressful psychophysiological reactions.

6.1 EXPERIENCED SPACE

In his key text '*The Poetics of the Reverie*' (1971, p. 6), Bachelard discusses how when one is pleasantly lost in one's thoughts ('a reverie') "all the senses awaken and fall into harmony". This "polyphony of the senses" (ibid, 1971, p. 6) not only occurs when one is in a transcendent pleasant state, but is a manifestation of everyday experiences. Within geographical research, it is now common to reject the primacy of the visual (known as ocularcentrisism - see G. Rose, 2003), emphasising the importance the other senses and embodied encounters (see, for example, M. Adams & Guy, 2007; Middleton, 2011; D. Moran, 2017). For "every touching experience … is multi-sensory; qualities of space, matter and scale are measured equally by the eye, ear, nose, skin, tongue, skeleton and muscle" (Pallasmaa, 2012, p. 45). Whilst we rarely use our senses in isolation, this section discusses three dominant sensory stimulations that occurred during the participant's walks (vision, audition, and smell) and how these impacted upon their psychophysiology.

Visual perception

It is well acknowledged that nature is beneficial, possibly vital, for health and wellbeing. This is because being in an natural environment or scene not only awakens our senses, facilitates social interactions and connections, and encourages physical activity, but,

crucially for this study, also prompts positive psychological and physiological responses (Marcus & Sachs, 2013). This positive effect of nature, which has been described as the 'Vitamin G'[90] effect, was apparent in the parkland of Moseley and Bournville. Yet it is not only parkland, as a predominately green space, that has a positive effect on the individual; the presence of trees or shrubbery or being beside a stretch of grass has a similar effect. For example, Matthew (Moseley resident, male, 45-54-years-old) had an decrease in EDA and minimal fluctuations in BVP whilst he was walking along Reddings Road (verdant and tree-lined) and Amesbury Road situated next to Moseley Hall Hospital which has large stretches of grassland (Figures 6.1 & 6.2). The low fluctuations in BVP would indicate that Matthew's parasympathetic nervous system was active (rest-and-digest rather than to fight-or-flight) and that he was in a relaxed state physiologically. In the interview Matthew explained that during the data collection he deliberately walked along roads that had some traces of green (considering it was winter) but where "peaceful [and] away from Alcester Road" (interview with Matthew, 05/12/16). As such, Matthew's reaction to the environment supports the work undertaken in Japan looking at the physiological effects of walking in a green environment compared to an urban environment, which have shown the physiological calming effects of natural features (Li et al., 2011; Park et al., 2007; 2010) regardless of whether they are positioned in a green or grey space.

[90] Vitamin G is a term used by Jolanda Maas to succinctly refer to the positive effect green space has upon one's health (ibid., 2008).

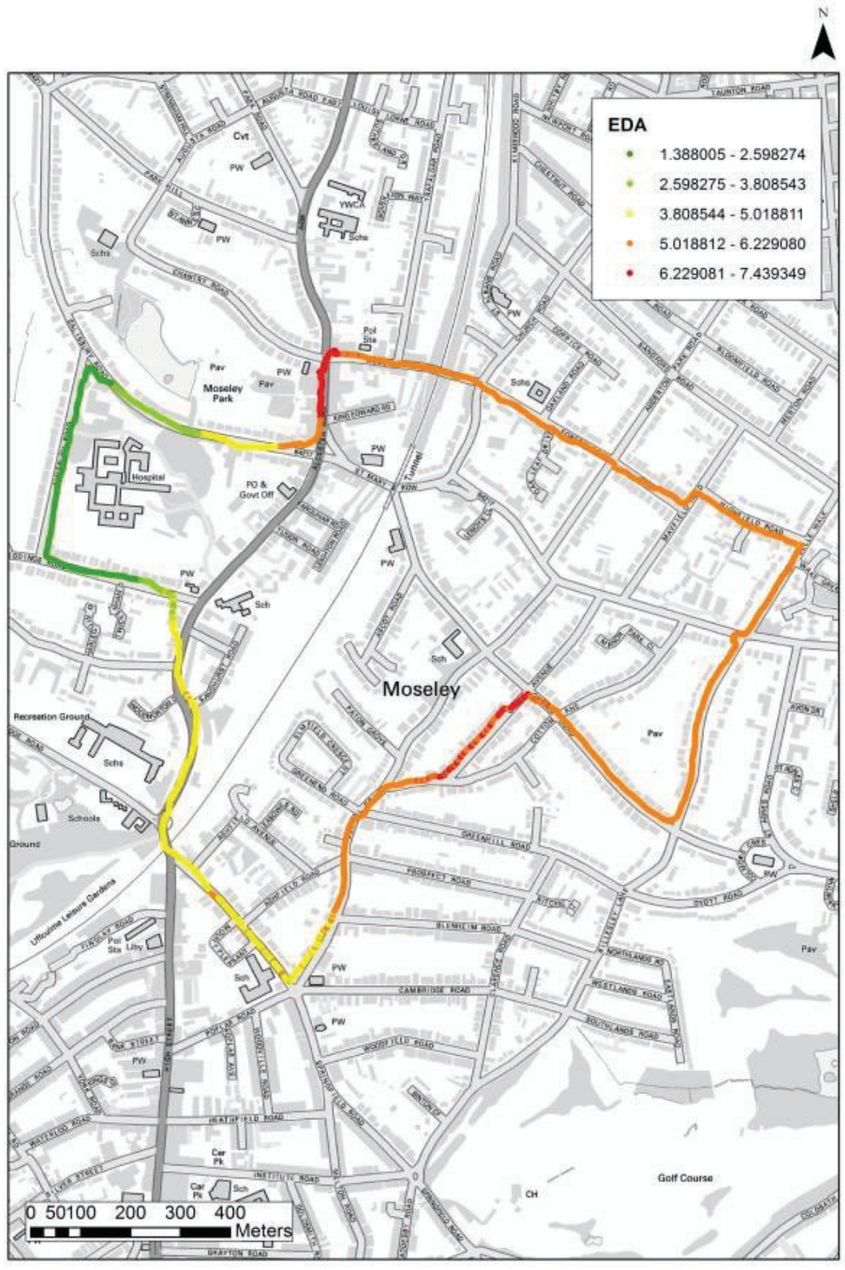


Figure 6.1: Matthew's EDA map - note the clear decline in EDA (green) along Reddings Road and Amesbury Road (west area of the map).

Figure 6.2: Matthew's BVP map – note the lack of high fluctuations in BVP (typically $-2\sigma > x > 2\sigma$ along Reddings Road and Amesbury Road (west area of the map).

Additionally, it has been argued that simply looking at water has been shown to be beneficial to one's health (Fredrickson & Levenson, 1998), and the fascination and attraction of waterscapes has been stated extensively by environmental psychologists (Coleman & Kearns, 2015; Völker & Kistemann, 2011, 2013; White et al., 2010) who comment on blue space's sensuous splendour as a major attractant. Sixteen (40%) of the participants were indeed drawn to the blue spaces of their particular areas, including that of Valley Parkway's Boating Lake and the Bourn in Bournville. Barry (Bournville resident, male, 35-44-years-old) and Max (Bournville worker, male, 35-44-years-old), for example, both stopped to look at the Bourn Brook during their walks because they "like the look of running water" (interview with Barry, 08/08/16). This quote, however, downplays the visual splendour of water with its unique ability to flow rhythmically through the bends of the river channel and play with the reflection of light on its turbulent surface, as well as humankind's attraction to the blue hue. Indeed, Max even stopped to take a photograph (Figure 6.3):

> "I was looking for nice camera shots so I went to the stream there so I could see kind of how the stream winds along. Because I know it does but I've never stopped and looked at it. Normal life doesn't necessarily allow that and it was nice to stop for a moment" (interview with Max, 09/08/16).

Max's account of the Bourn demonstrates the attraction of the winding bends that water carves into the landscape but also capturing how the flowing water changes colour and the sun glistens on the turbulent but free surface (Figure 6.4). As Max's quote indicates, staring at water gave him a moment away from 'normal life' and relax briefly, thus suggesting that looking at water allows for a short period of quiescence (cf. Bissell, 2008, 2009): a moment of stillness or passivity that allows for psychophysiological relaxation.

Figure 6.3: Video still from Max's walk where he stops to take a photo of the Bourn

---

Figure 6.4: Video still from Alan's walk where he walks along the Valley Parkway Lake.[91]

[91] During this stretch of Alan's walk, he walks slower according to the GPS track – perhaps because he was enjoying the view of the water.

The fascination and attraction of waterscapes has been discussed heavily, especially by environmental psychologists (Herzog, 1985; Völker & Kistemann, 2011; White et al., 2010). In their research it has been shown that people are prepared to pay more for houses and hotel rooms with views of water (Lange & Schaeffer, 2001; Luttik, 2000), and aquatic environments are a frequent aspect of people's favourite places (Kaplan & Kaplan, 1989; Korpela et al., 2010; White et al., 2010), preferred leisure destinations (Natural England, 2016), and recollections of positive children activities (Waite, 2007).[92] Crucially, water has certain visual properties that are attractive and potentially restorative. For instance, water reflects light in interesting ways, and it may be that certain lines and patterns of light are more restorative than others (Fernandez & Wilkins, 2008). The water discussed by Van den Berg (2009) had very little reflected light in the images (in comparison to White et al. (2010)) which may account for their null effect of water. White et al. (2010), on the other hand, demonstrated that the presence of water in an environment was generally rated more positively than without. This study, whilst supporting these arguments in environmental psychology, also demonstrates that the presence of water generates positive psychophysiological reactions (see, for example, Figures 6.8, 6.9 & 6.10). These positive reactions, however, are not solely influenced by the visual qualities but also the "polyphony of the senses" (Bachelard, 1971, p. 6), including audition.

Noise & conflicting attentions

> "Sight isolates, whereas sound incorporates; vision is directional, whereas sound in omni-directional. The sense of sight implies exteriority, but sound creates an experience of interiority. I regard an object, but sound approaches me; the eye reaches, but the ear receives" (Pallasmaa, 2012, p. 53)

As this quote from architect Juhani Pallasmaa demonstrates, activation of the auditory sense is unintentional. Whilst we can direct our sight to an object, a sound in our environment normally gets our attention without intending. This unintentional detection of sound (*hearing*) differs to *listening*, which is a conscious process of directing one's attention to a sound (Blesser & Salter, 2009). In an urban setting there are a variety of sounds, and whilst the participants may not have intentionally *listened* to them, it was not possible for them to

[92] The relationship between water and childhood memories is discussed later in the chapter.

avoid *hearing* them.[93] If these sounds are unwanted and disturb the attention of an individual they can be categorised as noise, which is a great and growing environmental issue in urban areas as both a nuisance and an environmental stressor (Stansfeld & Matheson, 2003). Within the European Union, for example, it has been estimated that 80 million people are subject to noises levels that the European Commission deem unacceptable (above 65dB) and an additional 170 million live in areas that are exposed to noise levels between 55 and 65dB (European Commission, 1996)[94]. Even within the three case study areas, there are sections which are exposed to noise levels above 55 dB (Figure 6.5) - each of which are along main roads.

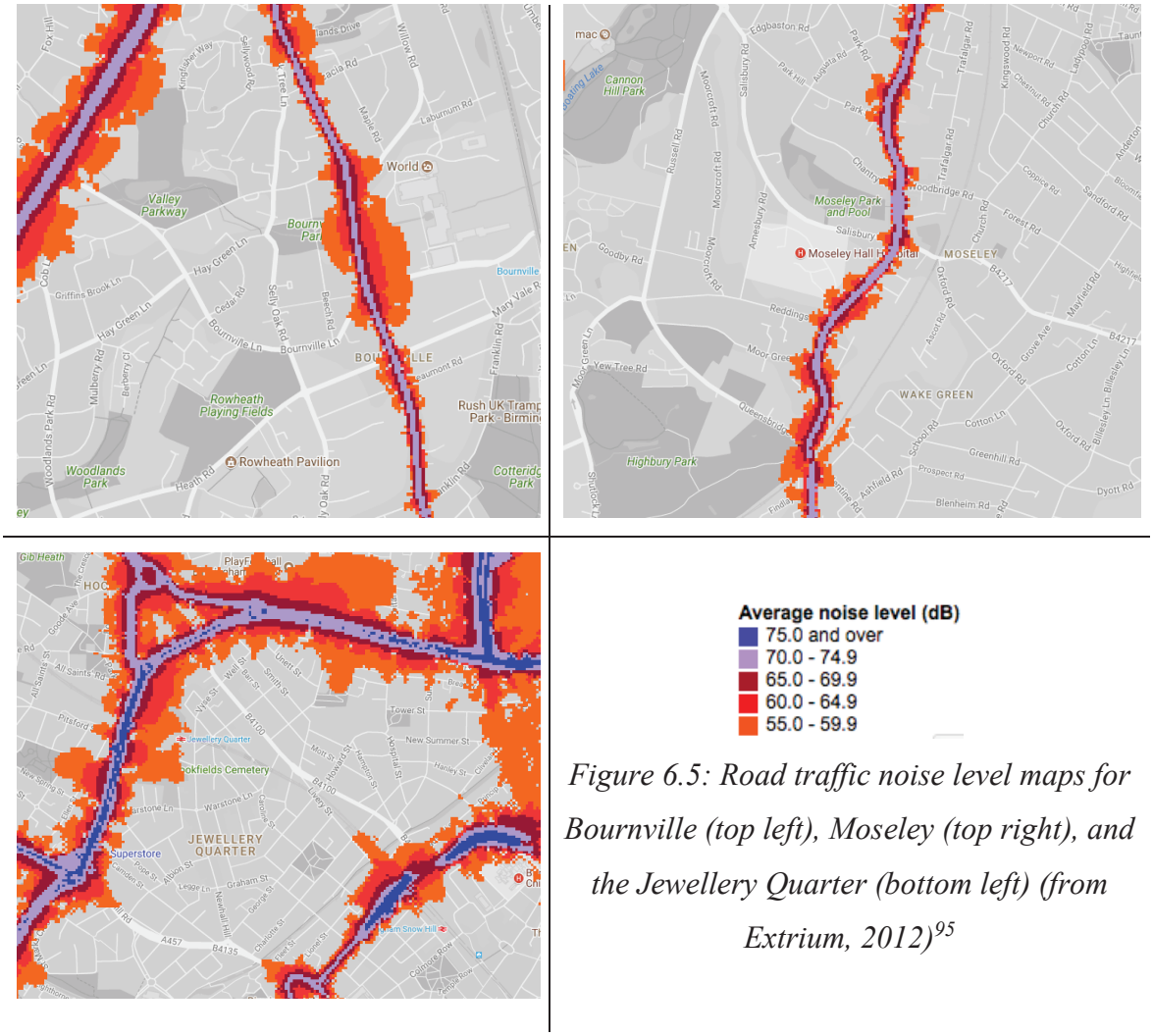


Figure 6.5: Road traffic noise level maps for Bournville (top left), Moseley (top right), and the Jewellery Quarter (bottom left) (from Extrium, 2012)[95]

[93] The participants were instructed not to use head-/earphones during their walks.

[94] Areas with noise levels above 65dB have been termed 'black area', and areas between 55 and 65dB are referred to 'grey areas' by the European Commission (1996).

[95] These noise maps were published by DEFRA in 2012 as part of the Environmental Noise Directive (DEFRA, 2015).

From these maps, it is clear that areas of the Jewellery Quarter are subject to significant levels of noise. Not only is the Jewellery Quarter encompassed by major A roads, but the lack of green and blue infrastructure in the area means that the majority of the high frequency noises are not absorbed (Magrini & Lisot, 2015). Indeed, research shows that trees and shrubs contribute to noise reduction (Cook & Van Haverbeke, 1974; Dover, 2015; Fang & Ling, 2005; Samara & Tsitsoni, 2011). Unlike Moseley and Bournville, none of the roads in the Jewellery Quarter are tree-lined. Furthermore, when this research took place the Jewellery Quarter was subject to increased levels of traffic because of a nearby development.[96] For Martin (Jewellery Quarter resident, male, 25-34-years-old) because he often worked from home, this increased traffic has a major impact on his life:

> "I recently counted how many buses go down our road each day and it's 1045 a day. No wonder I get distracted sometimes when I work at home with all that noise … it's not really affected driving too much because I know the short cuts through the Jewellery Quarter pretty much but it has increased the amount of traffic that goes past my flat. The buses, there used to be a couple of hundred a day and now there is 1000. And all the lorries heading into town and that now shuffle down this one lane road and take turns going past" (interview with Martin, 22/08/16).

Martin's account of the effect increased traffic has on his work demonstrates the effect that noise can have on an individual's attention, where attention is understood here as an umbrella term used to describe a set of attentional sub-processes that collectively determine an individual's ability to process different stimuli (Hannah, 2013; Itti et al., 2005; Treadway & Lazar, 2010; Varkovetski, 2016). Examples of these attentional sub-processes include *alerting* (becoming aware of an unexpected stimulus), *sustained attention* to a single object, and *conflict monitoring* (remaining focused on a preferred stimulus despite the presence of a distracting or conflicting stimulus). Martin's account of trying to work therefore is an example of chronic altering that disables sustained attention due to an inability to monitor the conflict between the two; which can be succinctly described as 'directed attention fatigue' (DAF). DAF, as a neurological state that occurs when our voluntary attention (the part of the brain that we use to concentrate on particular stimuli while ignoring distractions)

[96] The development here is the demolition and redevelopment of the Paradise Circus, a civic area just to the south west of the Jewellery Quarter (see Paradise Birmingham, 2018 for more information).

gets worn down, has been shown to contribute to various cognitive deficits, such as memory problems and poor sustained attention (Hölzel et al., 2010) such as Martin described. DAF has also been shown to cause non-auditory stress effects such as (prolonged) changes in the physiological systems, including increased blood pressure (Babisch et al., 2005; Gidlof-Gunnarsson & Öhrström, 2007; Öhrström, 2004; Stansfeld et al., 2005). Since Martin was retrospectively talking about this experience, however, it is impossible to see how this specific case of traffic noise affected Martin's psychophysiological response.

Yet many of the participants walked along some of the busier roads in their areas and had a clear psychophysiological response. For example, Michelle's (Moseley resident, female, 35-44-years-old) walk demonstrates the ways traffic affect the body. Michelle began her walk through Moseley Park and Pool before travelling down Salisbury Road (Figure 6.6). In Figure 6.6, there is a clear and reasonably low EDA recording whilst she was walking through the parkland, but of interest here are the recordings along Salisbury Road. Along this stretch, there are fluctuations between high EDA (red) and moderate EDA (orange) levels - whilst these recordings counter those from the parkland, the fluctuations occurred when there was a vehicle driving past Michelle:

> "I'm now out on Salisbury Road and it is quite busy, although not as busy as I thought it would be […] You are just aware that there is traffic and it's quite fast. I would normally avoid it on the bike because of the hills so I come up a different road. I'm not inclined to do that road as a pedestrian either, and I also found out that it is a lot longer than I anticipated. The bus was interesting because I saw that coming towards me and there is that sphincter muscle clenching moment [gasps] when something like that it coming towards you. It's actually a few seconds after when you get buffeted by the slip stream of the bus, you know you get hit by the air and that is the actually bit that makes you gasp" (interview with Michelle, 28/11/16).

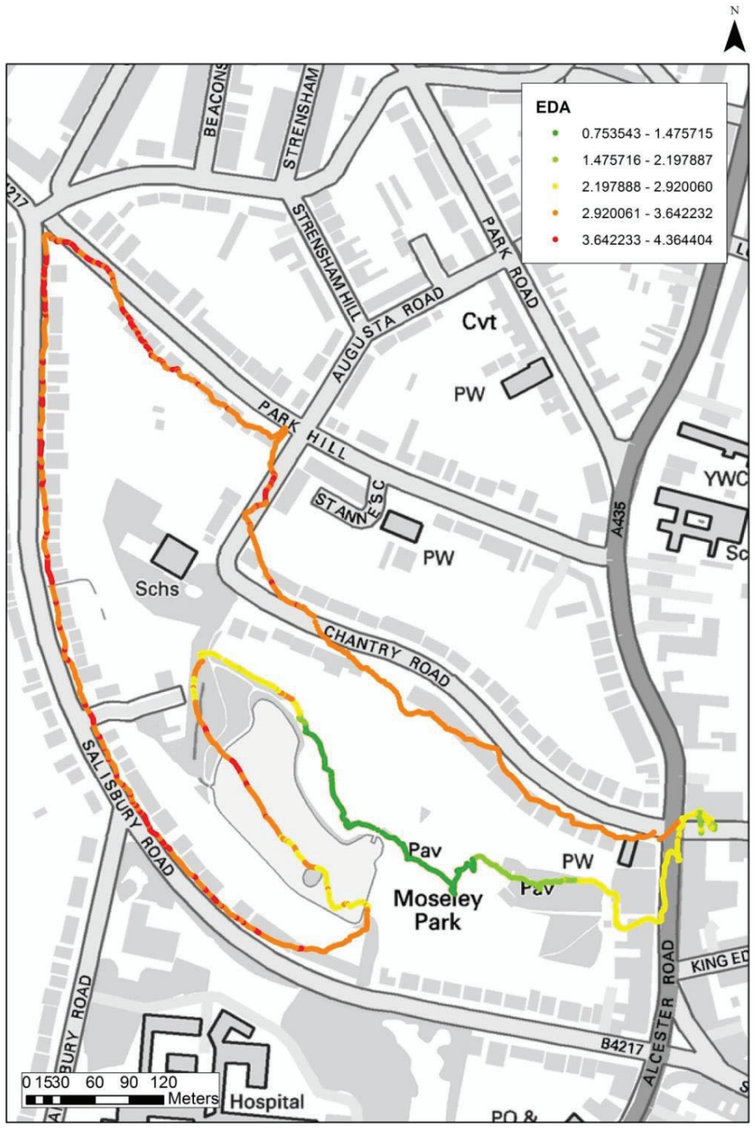


Figure 6.6: Michelle's EDA Map - Note the fluctuations in high to moderate EDA levels (red and orange) whilst she was walking along Salisbury Road and the low EDA levels (green) in the park. The latter would imply that she was relaxed whilst the former implies a degree of physiological stress.[97]

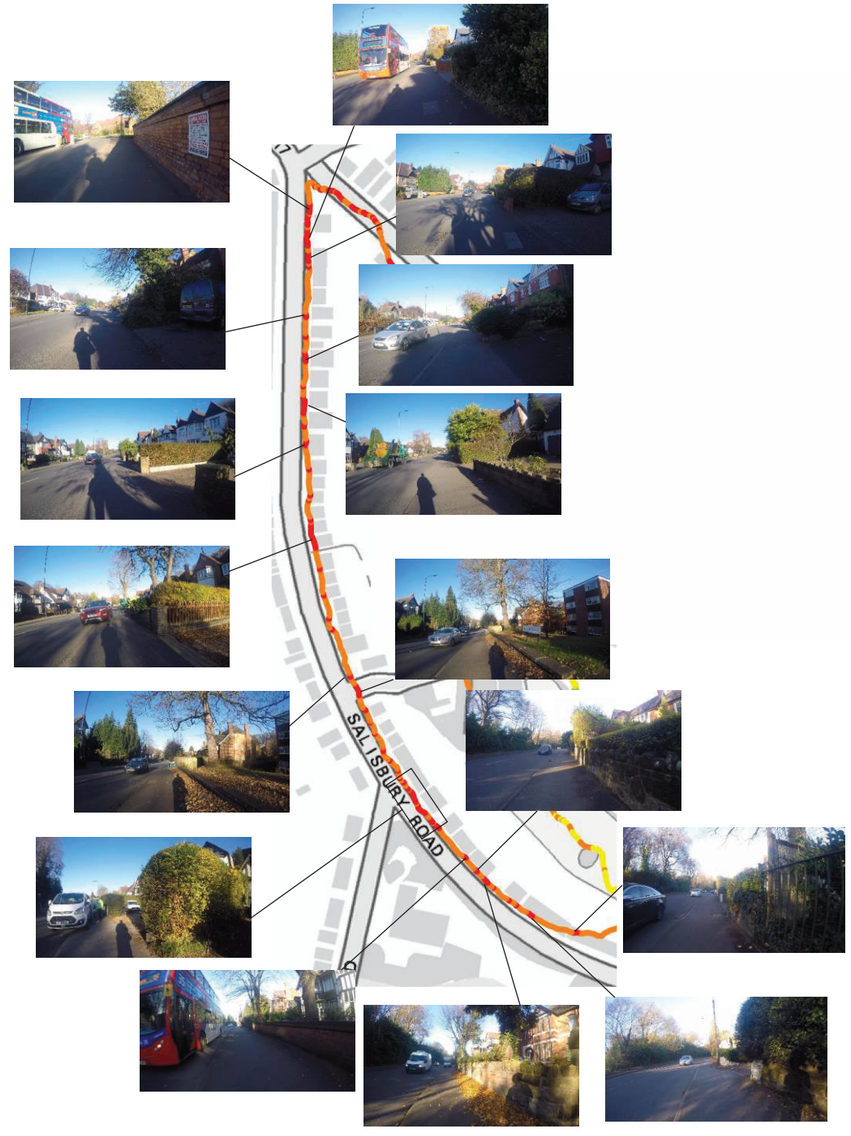


Figure 6.7: Annotated version of Michelle's EDA map (after Figure 6.6) using video stills focusing on Salisbury Road. The increased levels of EDA (red) coincide with when a vehicle passes her or when there is an obstruction on the pavement.

[97]The short period of high EDA in the park whilst she was walking in the park occurred when the noise from construction was within ear shot: "Here there were sounds of building work, which didn't match with the view at all. It was quite intrusive. It was stop-start" (interview with Michelle, 28/11/16)

Using the timestamped biodata and the video footage, Figure 6.7 demonstrates that the peaks in EDA (red) coincided with instances of a vehicle passing Michelle on the nearest side of the road. Additionally, the prolonged instances of high EDA (for more than a couple of a seconds) occurred when a heavy vehicle, such as a bus, passed her. The quote, however, shows that it was not only the noise of the vehicles that caused the physiological reactions, but also the disturbances to the environment from the vehicles, including the wind created by the wake of the vehicle once it had passed.

Crucially, Michelle's reaction to walking along Salisbury Road (as primarily a grey space but with green features) encompasses more than just the visual and the audible; it is a fully embodied and cognitive experience. Not only does Michelle sense the environmental changes through her body, but her body reacts to those changes. Her embodied (re)actions, however, also feed (and may even respond to) her cognitive recognition of that feeling. As such, Michelle's experience of Salisbury Road demonstrates how conscious perception arises from sensory stimulation that is grounded in the sensorimotor processes of the body (cf. Merleau-Ponty, 2002; Protevi, 2010). Intention and consciousness related to that perception, therefore, depends on experiences of body with different sensorimotor capabilities within broader biological and psychological contexts (Clark, 2011; Kiverstein, 2012; Varela et al, 1993). Simply, perception arises from an entanglement of sensory and motor processes, (re)action across the cognitive strata (non-, pre-, and conscious), and the environment; an "ongoing interactive dance between brain and world [through the body]" (Sutton, 2006, p. 282).

Aside from DAF and negative psychophysiological response (inducing noises primarily found in predominantly grey spaces), there are audible qualities of an environment that can sooth and relax an individual. For example, both Rachel [Bournville resident, female, 25-34-years-old] and Alan [Bournville resident, male, 65+-years-old] commented upon how the sounds of Bournville Park, with the trees and the Bourn Brook (a small river that flows through Bournville), were a relaxing quality for the blue/green space. Indeed, this moment was particularly relaxing for Alan, whose EDA recording declined when he was in Bournville Park. Alan spoke about the noise of the wind blowing through the tree foliage and how it has this "calming rustling sound" (interview with Alan, 04/08/2016) that was "not in your face like the noises from the road".

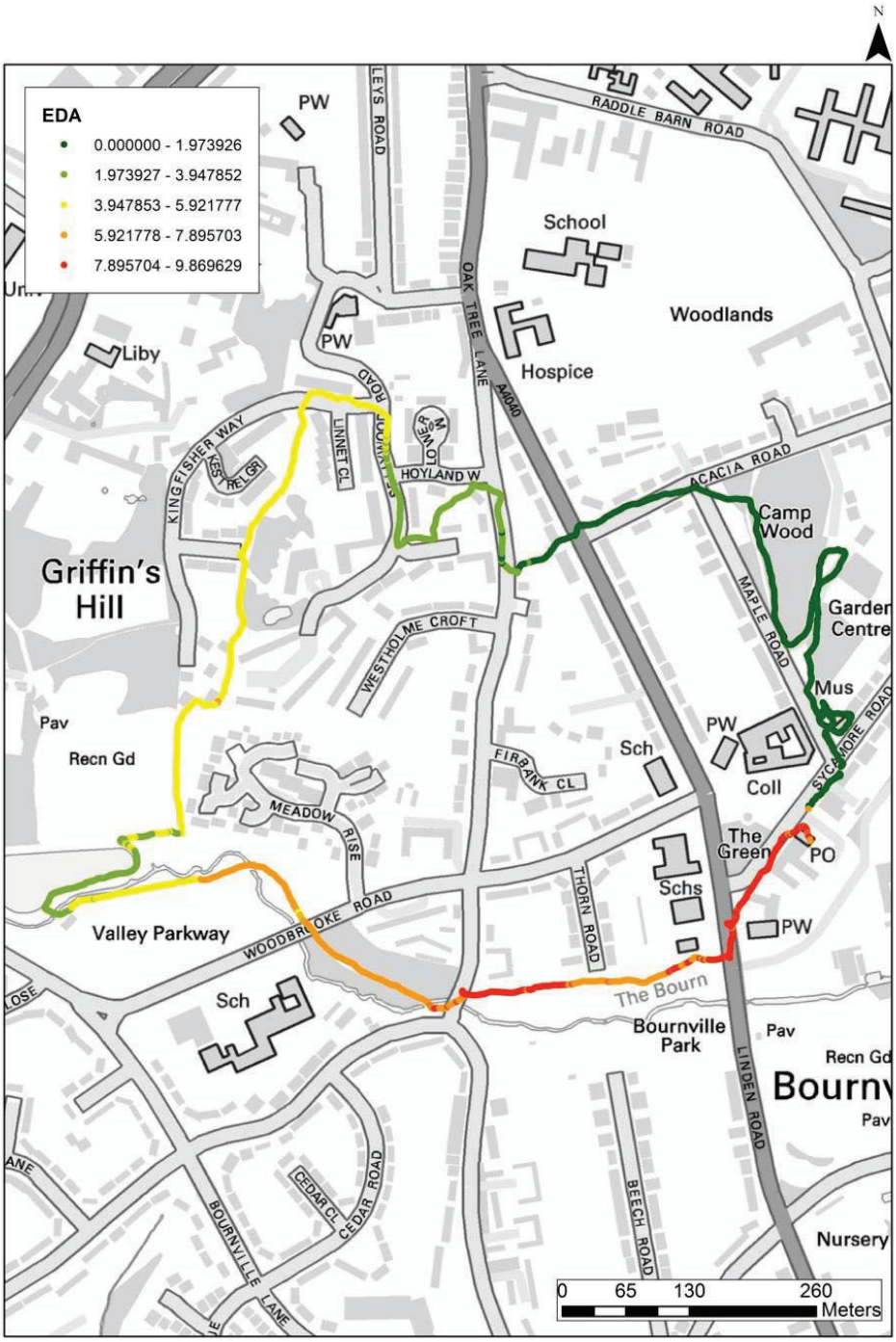


Figure 6.8: Alan's EDA map. The map follows a pattern that is common among the participants – the EDA recording increases gradually throughout the walk (dark green through to red). However, note the decline in EDA in Bournville Park (red to orange back to red) and the low readings (light green) around the boating lake at Valley Parkway indicating that the parasympathetic nervous system was activated there (cf. Kreibig, 2010)

'Natural' sounds, such as those described by Rachel and Alan, have been shown in environmental psychological literature to simultaneously encourage appreciation of natural environments and promote a positive psychophysiological response. For example, psychologist Elizabeth Ligon Björk (1986, 1995) took psychophysiological readings[98] whilst playing a variety of sounds to their participants. These experiments showed that the sounds of water and birdsong (not including alarm calls) induced a psychophysiological state of relaxation. Additionally, it has also been found that the therapeutic qualities of natural landscapes can be hindered by the presence of man-made sounds (Carles et al., 1999). It can be argued that natural sounds (such as water, birdsong, tree canopy rustling etc.) are examples of 'soft fascination'; a sensory experience that is able to attract one's attention but is not so taxing to the individual that it overpowers the senses and the capacities of the mind, such as in Martin's example (Kaplan & Kaplan, 1989). Most man-made sounds (such as traffic, building work, sirens, etc.), however, are loud and interruptive and therefore would be termed 'alerting' by psychologists (Itti et al., 2005; Treadway & Lazar, 2010; Varkovetski, 2016).

Smell & the notion of 'freshness'

In addition to the sound and visuality, the smells of an environment are incredibly important, and impact upon people's everyday experience and perception of place. Scholars interested in the aromatic qualities of space use the term 'smellscape' (J. D. Porteous, 1985) to describe the olfactory landscape. Porteous' (1985) notion of a smellscape accommodates for both episodic (foregrounded) and involuntary odours. On the contrary, however, it has been argued that it is impossible for an individual to detect the entirety of a smellscape because the smell environment is not as clear, continuous, or integrated in comparison to visual and auditory landscapes (Rodaway, 2002). Regardless, there are significant links between cities, place and smell; scholars have demonstrated how smell can be linked to both place perception and memory (Barbara & Perliss, 2006; Henshaw, 2013; Landry, 2006; Quercia et al., 2015).

It is common for human beings to identify a smell yet to be unable to name exactly what they are smelling or why they are having a (psychophysiological) response (Henshaw,

[98] The psychophysiological parameters measured in the experiment were heart rate, skin conductance, and electromyograph responses (Björk, 1986, 1995).

2013). Regarding the smell of water in particular, it is quite difficult to evaluate what represents the connectedness to the water because the blue spaces of Birmingham are typically freshwater and do not have that faint salty smell like that along a coastline. The connection is closer when one considers the movement of air; rivers, for example, act as a corridor to supply fresh air into cities especially (Völker & Kistemann, 2013). To complicate things further this fresh air is not only clean smelling air but can also act at a coolant in the summer. Although not a river, the boating lake at Valley Parkway had a noticeable impact upon many of the participants, which could be contributed to the fresh air and cooling qualities of the lake in the parkland (Figures 6.9 & 6.10). Indeed, many scholars in physical geography have demonstrated the cooling qualities of blue space in urban areas (see, for example, Bowler et al., 2010; Coutts et al., 2012; Sun & Chen, 2012).

Whilst both verbally expressed that Valley Parkway Boating Lake was a space of beauty and relaxation, Julie and Max both experienced a decline in EDA and TEMP which would imply, in accordance with Kreibig (2010), that they were sad (Figures 6.9 & 6.10). Julie, however, declared that the boating lake was her favourite place on the walk, and it is therefore improbable that she was feeling sad:

> "Interviewer: What was your favourite place on the walk today?
> Julie: Probably the yachting pool actually, it's lovely … all the ducks were out, and the geese. It's just a nice place to be. It was really relaxing" (interview with Julie, 09/08/17).

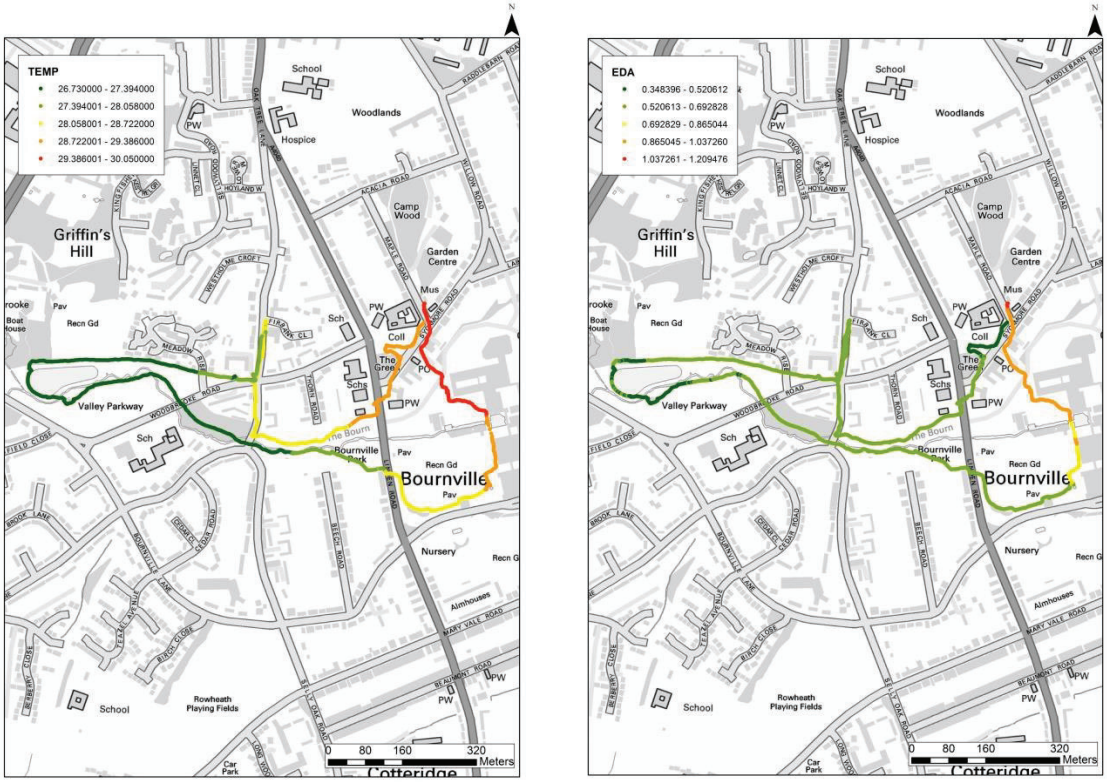


Figure 6.9: Max's EDA and TEMP Maps - around Valley Parkway boating lake there is a similar decline in EDA and TEMP (dark green dots).

Figure 6.10: Julie's EDA and TEMP Maps - around Valley Parkway Lake there is an extended period of low EDA and TEMP (dark green dots).

As such, it can be assumed that some of the blue space, especially that of Valley Parkway Boating Lake, has a strong cooling effect which is capable of reducing the skin temperature and the sweat levels on an individual. Even so, the majority of the walks undertaken in Bournville occurred in the height of summer and therefore the cooling effect and the view of water may have produced a sense of freshness and coolness (Burmil et al., 1999; Herzog, 1985; Nutsford et al., 2016; Völker & Kistemann, 2013; Yamashita, 2002). This sense of freshness, which is likely a result of the cooling properties of the blue space, has been shown to be encouraged by the clearly visible or individually perceived blue colour of the water (Burmil et al., 1999; Herzog, 1985). Therefore, the cooling effect is a combination of an individual experiencing a real and imagined freshness simultaneously which only occurs when the senses are used in concert.

Not all odours (and the associated psychophysiological effects) were unidentifiable, however. The smell from road vehicles, in particular, was highlighted by eleven (27%) of the participants; for instance:

> "Rachel: [Bournville] is my little utopia because everything is green and pretty […] No matter what angle you come in it's just this beautiful green and fresh smelling place. Yeah, it smells different.
> Interviewer: How does it smell different?
> Rachel: It smells clean. From walking that little bit up Linden Road, on the main road you start to smell the cars, the traffic and the heavy exhausts and then you step off onto Bournville Lane and back towards the centre and its free and fresh. Lots of parks; it's just fresh" (interview with Rachel, 10/08/2016).

Just as Henshaw (2013) and Taylor (2003) have shown that the smell of traffic fumes, such as that described by Rachel, are a disliked smell that is frequently associated with urban environments. Furthermore, and along with the sonic disturbances discussed previously, traffic also impacts upon individual assessments of air quality and therefore the participant's sense of their own health. Not only does a fresh smell contribute to the therapeutic qualities of a landscape, but also allows people to consider the effects that air quality have upon their, and their families, health. Indeed, many participants in Moseley spoke about keeping their

children away from the main road (Alcester Road) during the school run because it well known that the road has high levels of pollution.[99]

Whilst most studies that have looked into perception of pollution have tended to focus on the visual qualities of smoke or fumes emitted from cars (Bickerstaff, 2004; Bickerstaff & Walker, 2001; Horlick-Jones et al., 2003; Wakefield et al., 2001), the chemicals from traffic pollution not only stimulate the olfactory nerves but also trigger the trigeminal nerve.[100] Some pollutants are only detectable through the trigeminal nerve (Henshaw, 2013; R. Herz, 2006), and these traffic-induced trigeminal experiences were generally described by participants in negative terms, often likening them to the feeling of burning and/or linked to the gustatory sense (i.e. they can taste the chemicals). Unlike the sounds from traffic (which can sometimes be described as positive - see for example W. Davies et al., 2007), the smell of the pollution has been shown in this study to be predominantly regarded as negative:

> "I was just coming to the top of Chantry Road and I turned round the corner. There were two huge lorries and lorries use the A435 as a cut through off the M42 to the city centre. Therefore you have a lot of heavy traffic using this main road a lot of the time including the local residents and the taxis. It adds to the pollution which is not great for our health but also leaves this lingering smell which isn't pleasant" (interview with Pauline, 30/11/2016).

Crucially this focus on air quality and pollution demonstrates that it is not solely being present in a grey space that stresses the person, or is determinental to their well-being, but that it is the smaller features (such as pollution) that had a significant effect of the participants across the three areas

Bournville, for example, as an industrial yet verdant landscape is rather unique regarding its smellscape. The Cadbury Factory is a major industrial institution that leads to increased numbers of heavy vehicles in the area ("It's a shame that the big lorries have to come down there but then again it is a big factory, so you have to have lorries" - interview with Valerie,

[99] Alcester Road was in fact the subject of a BBC documentary on air quality entitled 'Fighting for Air' which was aired around the time of data collection - https://www.bbc.co.uk/programmes/b09m2djj

[100] The trigeminal nerve is the largest cranial nerve that contributes to sinus action and mastication, and aides parasympathetic supply by transporting neurons.

20/10/16), but the air emissions from the factory were pleasant for the participants. Half of the Bournville residents reported that the immediate area around the Cadbury Factory had a pleasant smell of chocolate; however, only Mike and Joe smelt the aroma on their walks (although both had a positive emotional (Figure 6.11)). Regardless, all those who mentioned the smell of chocolate spoke fondly of the smell, especially when they remembered it from their childhood (memories and childhood nostalgias will be discussed in the next chapter).

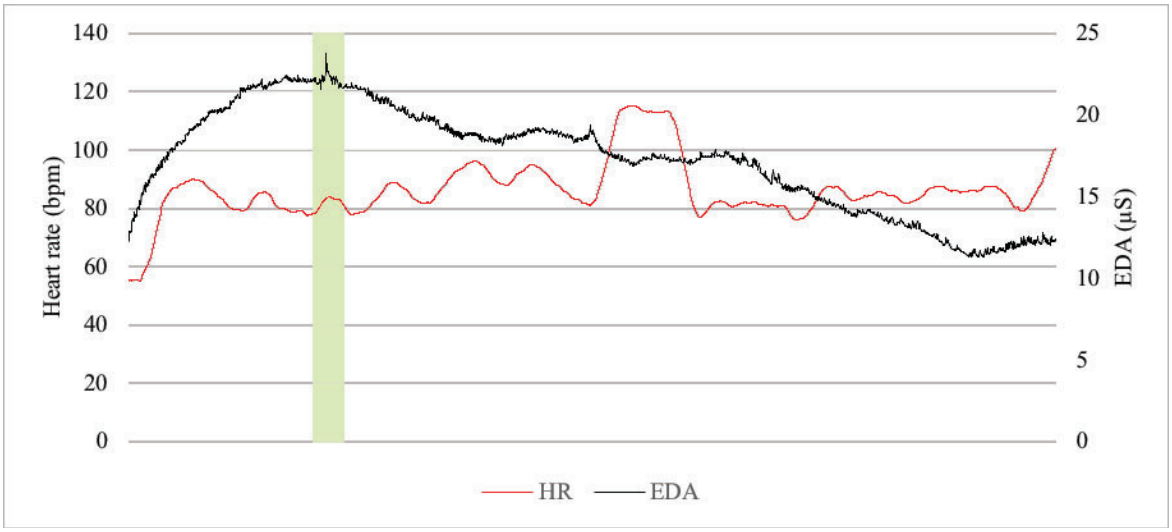


Figure 6.11: Mike's EDA and HR biodata – the highlighted area, which corresponds with a time when he was walking past the Cadbury Factory, shows a spike in EDA and a corresponding moderate increase in HR. Additionally, with the increased fluctuation in BVP (~ ±100nW) and a constant TEMP (~ 32.7° C), these recordings would imply that for a brief moment Mike was excited or amused.

6.2 SOCIAL ACTIVITY

Social and physical environments do not exist independently of each other; any environment is the result of continuing interactions between the two. The public spaces which the participants passed through during their walks represent those sites of sociability. These social spaces are a locus for social relations and community engagement (Agnew, 1987; Cattell et al., 2008; Eyles & Litva, 1998). These spaces are important for stress recovery and

positive mood change because they provide support, a sense of belonging and identity, facilitate social integration, and confer esteem: each of which have been shown to be beneficial for health, well-being, and quality of life (Cattell et al., 2008; Maas et al., 2009; Völker & Kistemann, 2013). Völker & Kistemann (2011, 2013) suggest that the social accessibility and vitality of a space are the most important social qualities of a therapeutic space.

The most important aspect concerning the social spaces of Bournville, Moseley, and the Jewellery Quarter is the communication between people. Following on from the previous section, the sounds of people interacting contribute to the symbolic valence of a space's atmosphere (discussed later in the chapter) and its therapeutic qualities. For instance, the sounds of children playing were an additional positive quality found in the parks:

> "The song of the children playing … really resonates with me (interview with Barry, 08/08/16)
>
> "I walked through Bournville Park, it was very pleasant the stream was just babbling away. Even just the odd sound of children chattering is just white noise because it's calm. You can hear birds. It's calm and soothing" (interview with Rachel, 10/08/16).

It has already been shown that natural spaces facilitate increased social contact through providing vital meeting places and opportunities for social activities to take place (Ashbullby et al., 2013; Maas et al., 2009; Völker & Kistemann, 2015). Indeed, just over 50% of the 3.1 billion estimated annual visits (between March 2015 and February 2016) in England to natural spaces, including urban parkland, were undertaken with least one other person (adult or child) (Natural England, 2016). This section, however, focuses on the social qualities of the various public spaces (not just natural spaces) in the case study areas. For the participants during their walks, these public spaces were "spaces of encounters between strangers" (Ruppert, 2006, p. 272) since they were walking alone, and the vast majority of people did not see or engage with people they knew. Despite this, the participant's interactions with the various spaces demonstrate the importance of the quality of public space (including accessibility and maintenance) and its social vitality (cf. Völker & Kistemann, 2015).

Social vitality

Vitality has been argued to be what distinguishes successful urban areas from others. To quote John Montgomery (1998, p. 97), vitality is "the numbers of people in and around [a space…] across different times of the day and night, the uptake of facilities, the number of cultural events and celebrations over the year, the presence of an active street life, and generally the extent to which a place feels alive or lively". A place with social vitality, therefore, has its own rhythm, life force, or *élan vital* (cf. Bergson, 1911). Montgomery's (1998) emphasis on urban design place making, however, means that he suggests that urban vitality can only be achieved through diversity of land uses and economic activity. Contrary to this and consolidating upon the work on assemblages, I suggest that these spaces of social vitality encompass the material and the immaterial, the human and the nonhuman, the real and the virtual, and the (affective) flows between them (McFarlane, 2009, 2011; Shaw, 2014).

Moseley Park and Pool, for example, was a favoured place for many of the Moseley residents as Pauline (Moseley resident, female, 55-64-years-old) demonstrates:

> "It's just a great place; it's a great place for families. If you go at weekends or school holidays it's full of children and families. It's the wildlife and the peace and quiet that I love. I used to have a dog many years ago and this was my favourite place to take him for walks. But today it was just beautiful … There are lots of benches with dedications on them, which suggests that lots of people over the years have valued the park. But obviously, this used to be part of the estate. It is so beautiful. Because it's a favourite place and when we have visitors we always take them there because it is a very special place in Moseley and when it's a lovely day like this I will come down and walk around the lake." (interview with Pauline, 30/11/16).

As Pauline's quote demonstrates, this green/blue space is awash with social activities but not exclusively due the presence of other people, but also material traces of people's past engagement with the park (such as the bench dedications) and her memories of that space. The benches, as materialities, are ascribed a symbolic social value through the dedication; this process blurs the objective and subjective values of the material to develop social objects (P. Jackson, 2000; D. Miller, 1991). These social objects have a social and emotional

affordance which, in this example, affect Pauline and enrich her experience of Moseley Park and Pool.

Looking at social vitality on a larger scale, proximity to others goes hand-in-hand with urban living (D. Mitchell & Heynen, 2009; Rishbeth & Rogaly, 2018; H. F. Wilson & Darling, 2016) and was felt and (mostly) valued in the three areas. This proximity to others is especially prevalent in the Jewellery Quarter where the population density is approximately 6,500 pop./km^2 (in comparison to Bournville and Moseley at 4,217 pop./km^2 and 4,402 pop./km^2 respectively) (ONS, 2011) which could imply that the Jewellery Quarter may be prone to crowding. Crowding, while linked to population density, is subjectively perceived; it occurs when an individual's regulation of social interaction is unsuccessful and the level of social interaction is exceeded by the amount of social interaction experienced (G. Evans & Wener, 2007). Despite the high population density and the likely feeling of crowding, the participants in this study likened living in the Jewellery Quarter to living in a village:

> "Living in the Jewellery Quarter is like living in a village […] everyone's here because they want to be. Nobody cares about your business because they are like you and therefore there is a mutual likeness between people. So it's a really nice community feel of lots of similar people" (interview with Amanda, 23/08/16).

This sense of community, defined as "feeling that members have of belonging and being important to each other and a shared faith that members' needs will be met by the commitment to be together" (McMillan & Chavis, 1986, p. 8), was a common feeling among the Jewellery Quarter participants. Indeed, the majority of the Jewellery Quarter residents (60%) made reference to the community feel in the area. This feeling, however, contradicts other research that suggests that residents favour less social interaction and have a lower sense of community in high density neighbourhoods (Brueckner & Largey, 2008; French et al., 2014; D. Nguyen, 2010; Yang, 2008).

Regardless, other factors have been shown (here and in other research) to have a greater influence on an area's sense of community. Jane Jacobs (1972), for example, advocated the use of mixed-use urban development (cf. Pendola & Gen, 2008; Yang, 2008) and the importance of perceived safety (cf. Leyden, 2003; Talen, 1999) as means to encourage a

sense of community.[101] For instance, Sonya (Moseley resident, female, 45-54-years-old) commented on how important her perceived safety is:

> "Well [Moseley]'s just such a fantastic area, it's completely safe and that's one of the major things for me: it's safe. It's a very safe area and also the little bit that I live in is really neighbourly. So it's such a good little community and we look out for each other. That's what I really like about it, the tiny little community around my house. I live on my own so it's really important to me that the area around me is safe. I do a lot of walking about at all times of the day, it's a nice area because you can go out in the middle of the night and it's complete fine" (interview with Sonya, 25/11/2016).

Sonya's account of her perceived safety in her local area is shown to arise from the camaraderie of her neighbours and the (informal) social regulation of the space; thus, reducing the perceived opportunity for attack (Valentine, 1989). Furthermore, it has been argued that urban stress partially derives from vulnerability and social unease (Brighenti & Pavoni, 2019); therefore, feeling safe in an area not only adds to the social vitality of space but may also reduce the feeling of urban stress.

Obtaining personal space in a vital social space, however, was also shown to be significant to the participants because "an increased awareness of one's body in space and in relation to others is inevitable" (H. F. Wilson, 2011, p. 638). Michelle (Moseley resident, female, 35-44-years-old) during her walk chose to walk around the entirety of the pool, which she often does when she visits the park:

> "Michelle: So, this is my usual circuit of the park and you know how you always end up gravitating to the same seat and stuff. Well, I always seem to go around the pool in the same direction and take the same route. This side is a lot nicer than the other side. Look at that, it is a gorgeous day. I do like the water, it's very picturesque. There are some good birds on the lake usually. Now that the bin is out of shot I can say that this is the best bench.
>
> Interviewer: Why is this bench the best?

[101] It is also worth noting that Jane Jacobs (1972) also advocated for high density urban design to encourage social vitality.

> Michelle: I like this bench because of that view and it's kind of the furthest point of the pool and it's furthest away from where you get people doing BBQs or playing guitars or whatever. It's just a nice quiet little haven. Isolation is not quite the right word but it's a good place to sit alone. Occasionally there are fishermen over there and sometimes you have to share the same space with them. It is lovely so it was nice to sit there and chill. It's wonderful medicine" (interview with Michelle, 28/11/16)

For Michelle, the bench (Figure 6.12) is a surprising space of solitude away from the social locales in the park that stimulates a positive emotional reaction for her (Figure 6.13). Indeed, Cameron Duff's (2016) work on recovery describes 'spaces of solitude' as one of the potential recovery-enhancing aspects of outside space. Just like Duff's (2016) experience of an 'affective transition of wellness', when he encountered the human and non-human bodies of the botanical gardens, Michelle is subject to a particular space of relaxation comprising of material forces (the bench, the lake), bodies (the fisherman, trees), and the affective atmosphere of the "quiet little haven" (interview with Michelle, 28/11/16).

Figure 6.12: Video still, Michelle (28/11/16) - Moseley Pool

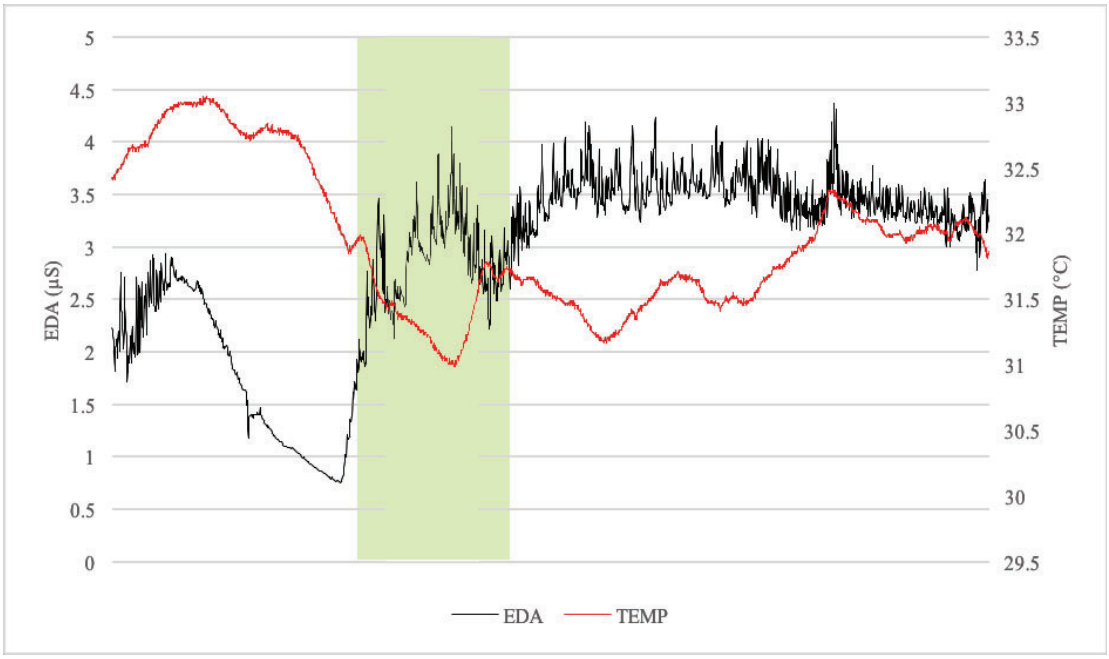


Figure 6.13: Michelle's EDA and TEMP biodata - the highlighted area shows a decline in EDA alongside an increase in TEMP which would indicate that Michelle was feeling content or happy. This highlighted area coincided with when Michelle was walking around the lake.

This study has shown that social vitality can arise from the material traces of sociability, sense of community, perceived safety, and the affective atmosphere of a space. As such, our understanding of social vitality should move beyond the significance of mixed land-use and economic activity to consider the social and affective influences. Michelle's account of Moseley Pool, however, shows that spaces of solitude are more psychophysiologically restorative than socially vital spaces despite the value that Sonya and Amanda ascribed to their neighbours and local community. Thus, another question arises: what makes a social space restorative?

A preference for 'real' space

With the exception of Michelle's account of Moseley Pool, the spaces discussed have been spaces rich with social vitality, or "place[s that] feel alive or lively" (Montgomery, 1998, p. 97). There were spaces that the participants encountered on their walks, however, which were not received positively in their subjective accounts or in the biodata. For example, Bournville Green, despite being at the heart of the Bournville Estate (Bournville Village Trust, 2017a), did not elicit the same variations in physiological responses compared to the other green spaces in Bournville - namely Bournville Park, Valley Parkway, Rowheath Playing Fields, and Cadbury Park. Some showed a preference for these spaces because they could not recreationally engage in the Green:

> "I don't really like Bournville [Green] that much; I mean it is nice, but it's not somewhere that inspires that much in me. I think it's pleasant so you can go and sit out on the grass in the summer but you don't see that many people congregating there … I think it is more of a transient place if anything. I see it as more of a place to look at than stay. I feel that is what it encourages too. That is my association with it" (interview with Dale, 03/08/16).

Indeed, there was very little change in the participant's physiological response when in and around Bournville Green. It can therefore be argued that the restorative potentials of green space are not solely due the visual qualities of the space, but an ability to engage with and in that space.

Bournville Park and Rowheath Playing Fields, on the other hand, were better received because they were considered a 'real' space. For example, Ben (Bournville resident, male, 25-34-years-old) argues:

> "I quite like that park because it's got a load of football goals, rugby posts… and I had a look across today and it had a load of sports teams doing training and people playing in the park, unlike other parts of Bournville, which feels like it's for show, it feels lived in, it feels real and feels part of the community … It's not kept there just to be perfect. It's actually part of the community" (interview with Ben, 13/08/16).

This preference for 'real' parkland is also reflected in the biodata of the participants who walked through those parks (Figures 6.14 & 6.15). For Rick (Bournville resident, male, 24-34-years-old), Bournville Park was a place that brings him happiness, not only because of the childhood memories he has there (for example "I have a lot of memories of growing up there. Tripping over, eating lollypops, needing stitches, playing on my bike"), but also the pleasing physical environment of the park:

> "It looks really pretty, it's got a river flowing through the middle of it. It's not a very big park – it's just nice, it's well maintained. It's got crocuses and daffodils in the spring. It's just a really well-maintained park. There is loads of stuff there. There is a bowling green, tennis courts, play area for children. Yeah, it's just a nice park" (interview with Rick, 01/08/16).

As a result, Bournville Park is Rick's favourite place in area and the place where he reported feeling happiest on his walk (Figures 6.14 & 6.15).

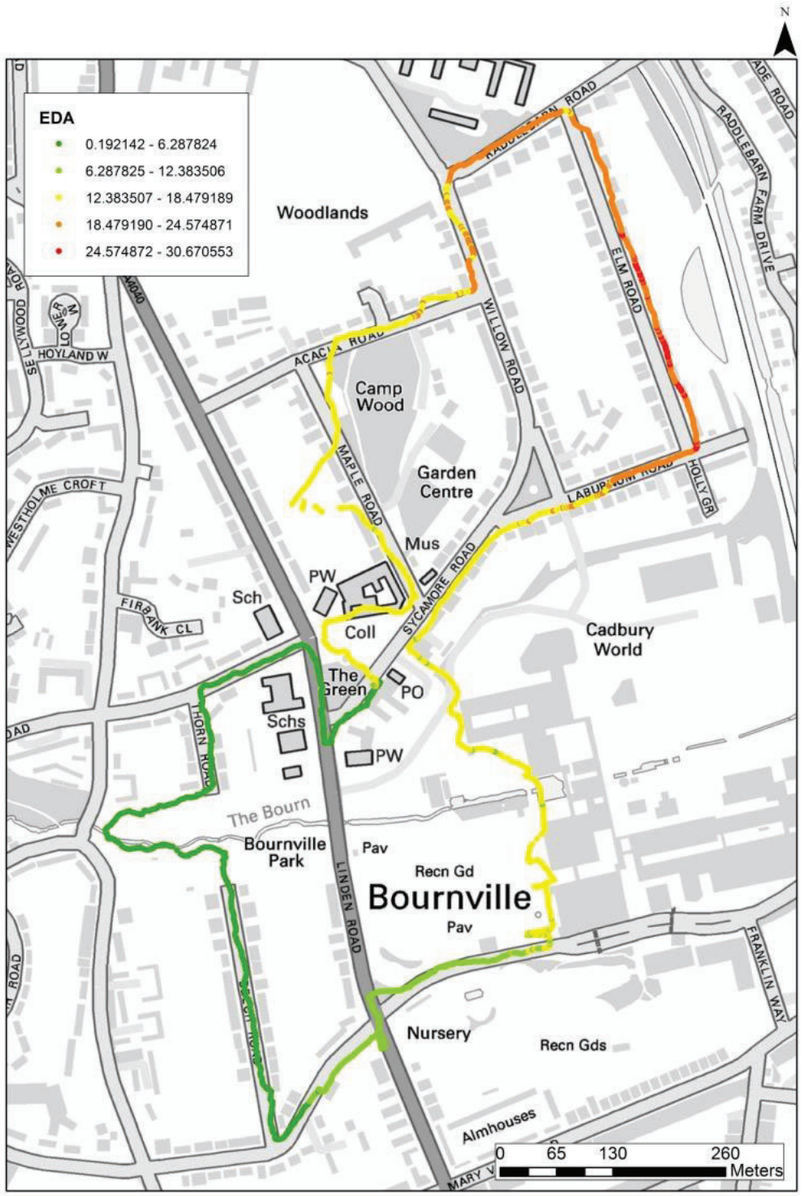


Figure 6.14: Rick's EDA map - note the decrease in EDA when he is walking through Bournville Park which would indicate a relaxed state.[102]

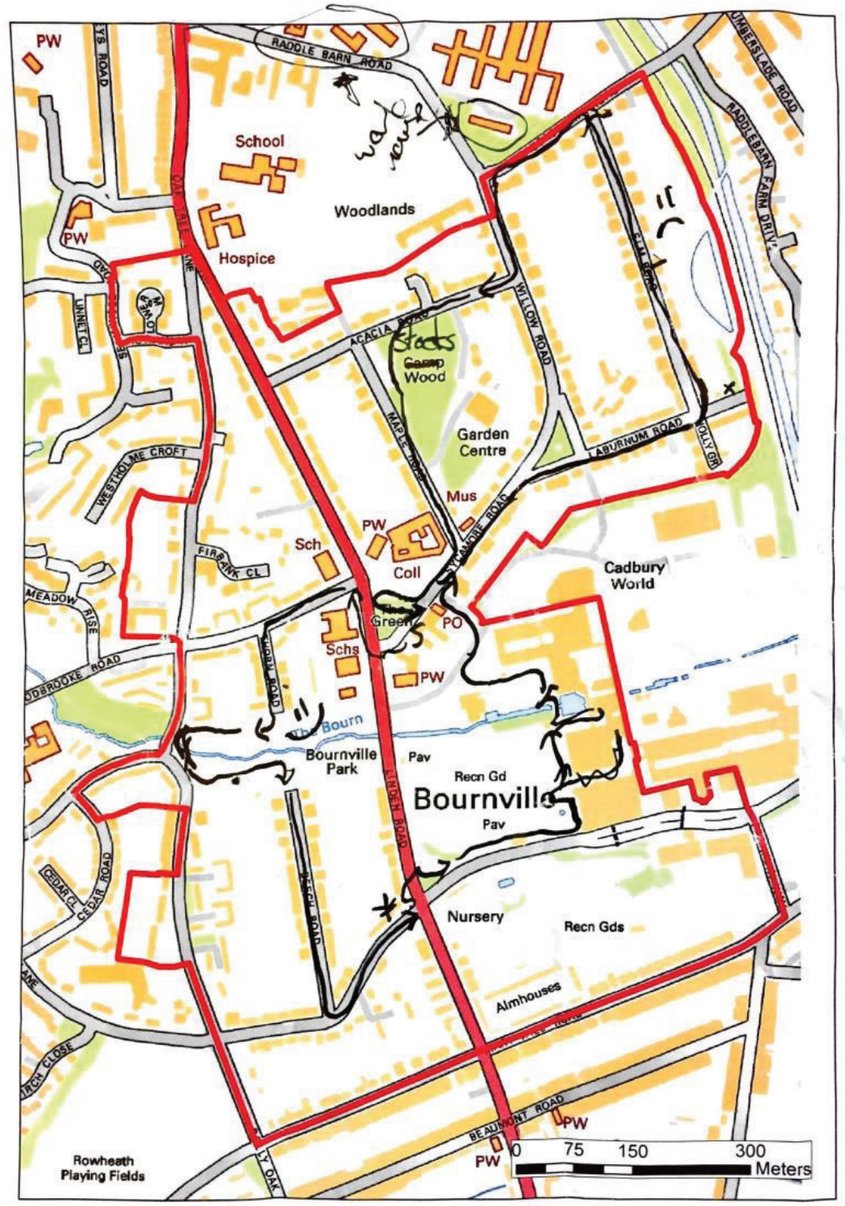


Figure 6.15: An annotated map drawn by Rick after his walk. Note how the smiley face and sad face match with the biodata in Figure 6.14.

[102] Along Elm Road (to the north east of the map) there is an increase in EDA and also where Rick reported being the saddest on his walk because he was walking past his old family home.

The spaces of social encounters discussed here demonstrate how important the quality and social vitality of a space is to its restorative capabilities. Specifically, the presence of social objects, perceived safety, a community feel, and opportunities for solitude are crucial in the development of a restorative social space, and in turn contribute to a sense of place. When these qualities are not present (or not in abundance at the very least) in a space, it has interpreted by the participants not 'real' or part of the community.

6.3 SYMBOLIC SPACE

Hitherto this chapter has discussed the physical and social aspects of the three case study areas and how they impact upon the psychophysiology of the participants. Whilst these two aspects of the environment are tangible and effable (and thus, easily demonstrated using the bio- and interview data), Gesler (2003) argues that the symbolic aspects of space are paramount to their therapeutic qualities. Despite Gesler's work on spiritual places of healing,[103] this symbolic space dimension (in accordance with Völker and Kistemann's two-dimensional matrix (2011)) adopts a broader view which encompasses spirituality (rather than just religion), the ascription of meaning, and the affective atmospheres of the space. Indeed, Duff (2016, p. 59) has argued that the processes of health recovery "link human and nonhuman spaces, bodies, objects and forces in the joint expression of an enhanced capacity to affect (and be affected by) other bodies and spaces".

Spiritual atmospheres

Bournville, as 'a Quaker experiment in town planning", is an obvious example of how religion can have an influence on space. Indeed, George Cadbury understood poor quality housing to be a critical factor in preventing impoverished city dwellers from adopting the Christian faith and the associated virtue of self-improvement (A. R. Bailey & Bryson, 2006, 2007). Rather than encouraging increased religious uptake through housing quality, each

[103] Examples include Lourdes (Gesler, 1996), Epidaurus (Gesler, 1993), and Bath (Gesler, 1998).

new resident received a copy of *Suggested Rules of Health*, providing advice on diet, sanitation and clothing[104] which was based on Cadbury's way of life: thriftiness, simplicity, and family worship (A. R. Bailey & Bryson, 2007). It is the final statement of the Suggested Rules of Health, however, where Cadbury's evangelical Quakerism becomes apparent:

> "In a truly happy home Father and Mother will conduct family worship at least once a day when the Bible should be read and a hymn sung" (Hillman, 1994, p. ii).

While it has been acknowledged that it is impossible to gauge whether the Bournville residents adopted these principles, there is proof that gardening was, and remains to be, popular in the area (A. R. Bailey, 2002). Indeed, twelve of the Bournville participants (60%) spoke of their practice of gardening either in their gardens or at allotments.

Returning to the built environment, Bournville Green is surrounded by religious buildings, with the Friend's Meeting House (Quaker) and Bournville Parish Church (Anglican) on either side of the green. Despite Cadbury's devote Quakerism, he always intended there to be an Anglican church in Bournville (Bournville Parish Church, 2018). As opposed to the Friend's Meeting House, Bournville Parish Church was a place of interest for many of the participants who spoke of their or a family member's wedding (e.g. Rachel and Terence), funerals (e.g. Rachel and Mike), and nativities (e.g. Mike, Nick, and Dan), among others. Yet while the church was spoken of fondly by many, there were no physiological reactions that arose from seeing the church. Perhaps the church's design is not overly evocative or the participants were not as religious as those in other studies (e.g. Perriam, 2015; Andrew Williams, 2016); even so, this lack of reaction suggests that other spiritual phenomena may generate a strong psychophysiological response.

There are some that would link spirituality to a denomination such as Quakerism, yet spirituality can also be dedicated to other self-chosen beliefs or values, not only to the belief in a religion. Dewsbury and Cloke (2009, p. 698) in their discussion of "spiritual landscapes" suggest that spiritual elements offer up "new imaginations of our place in the world and how

[104] The suggested rules included: the avoidance of intoxicating liquors, smoking, pork, carbonated drinks, and drugs; the practice of vegetarianism; sleeping for eight hours each day; single beds for married couples; outdoor exercise, particularly walking and gardening; the correct way to brew tea, and; the avoidance of wearing tight clothing among others (Hillman, 1994).

that world works", which arise from a connection between self, others, and the environment (including both the elemental and the physical). Therefore, the spiritual dimension of human experience is not necessarily about religion but ranges across faith-based systems of belief, ethical and moral beliefs in standards of human behaviour, and heightened sense of purpose (Perriam, 2015). Indeed Kong (2010, p. 757) recently called for geographers to move beyond the study of official or religious sacred sites and consider spirituality as the "sensuous ways in which the sacred is experienced and reproduced" across everyday experiences. For example, Moseley Park and Pool was a space of spiritual, but not religious, significance for Pauline (Moseley resident, female, 55-64-years-old):

> "It's a place that I have used in the past as a place to go to where I needed to sit and think. It's like a spiritual place. I'm not religious but I find I have some kind of spiritual or psychological wellbeing around here because it is so beautiful with the water, and the trees, and the bird song. That's what I find really special about it" (interview with Pauline, 30/11/16).

Pauline's account and engagement with Moseley Park and Pool is an example of spiritual performance where she is undertaking a contemplative walk through a place which is affective through its capacity for spiritual evocation (cf. Dewsbury & Cloke, 2009). As she experienced an increase in heart rate and skin temperature, which could be argued to indicate happiness (Kreibig, 2010), while walking through the park, Pauline's account demonstrates how a spiritual connection can bring hope and empowerment. Furthermore, Moseley Park and Pool is thus an example of Rose and Wiley's (2006) post-phenomenological work on landscapes, concerning the tension between presence and absence: the performance, creation, and perception of something unseen but profoundly felt. Thus, Pauline's account demonstrates that the spiritual is not necessarily tied to a religious experience; but instead, implies that the non-material virtual world is constitutive of a mixture of representative and non-representative registers (Dewsbury & Cloke, 2009; Andrew Williams, 2016).

Personal heritage & home

A space can also evoke emotions linked to an individual's personal heritage, including the spaces of their childhood, their birthplace, or social relationships that they had in that place. Whilst the role of memory in generating a psychophysiological response is discussed at length in the following chapter, Owen's [Jewellery Quarter resident, Male, 25-34-years-old] emotional connection with the canal arises from both his childhood memories and an escape

from the busyness of Birmingham. Unlike the blue spaces that have been discussed in this chapter, the canals in the Jewellery Quarter are not situated alongside or in green space; they are very much a hybrid of grey and blue space:

Figure 6.16: Video still from Owen's walk of the canals in the Jewellery Quarter.

> "Birmingham obviously claims that it has more canals than Venice but also I think for me it's that think where you work in the city and you have that fast-paced city life whereas going somewhere like that it gets you away from that mindset. Also, like I was saying earlier, a lot of my family background is agricultural and it reminds me of that feel. So, if I find somewhere, even a pocket of it that's just a bit different from city life I find that I really enjoy it. So that was really nice for me" (interview with Owen, 20/08/16)

As this quote demonstrates, Owen was reminded of his childhood in an agricultural setting but also took a comfort by being in a setting away from the busyness of the fast-paced city. Indeed, Owen's biodata (Figure 6.17) suggests that whilst he was walking along the canal he may have been experiencing relief (cf. Kreibig, 2010). Whilst there are some that do consider relief a bonafide emotion (Frijda, 1986; Kreibig, 2010; Lazarus, 1991), relief remains an under-researched phenomenon. As an emotional event, relief is dependent on an

unfolding event, such as a change in environment (like in Owen's case) or a resolution to a personal issue, rather than a single particular relational dilemma. As such, for relief to occur, the person must have been subject to a negative experience or phenomena which is then changed for the better to eliminate or subside the emotional distress. Relief, unlike any other emotion, therefore always requires an initial negative emotion (including anger, anxiety, guilt, shame, and disgust) which is "changed for the better or gone away" (Lazarus, 1991, p. 280) and, thus, realised explicitly demonstrating a strong cognitive aspect to the emotional experience.[105] Regardless, Owen's account of his experience and his biodata individually (and combined) demonstrate that the canals provided a sense of relief for him from the "fast-paced city" of Birmingham.

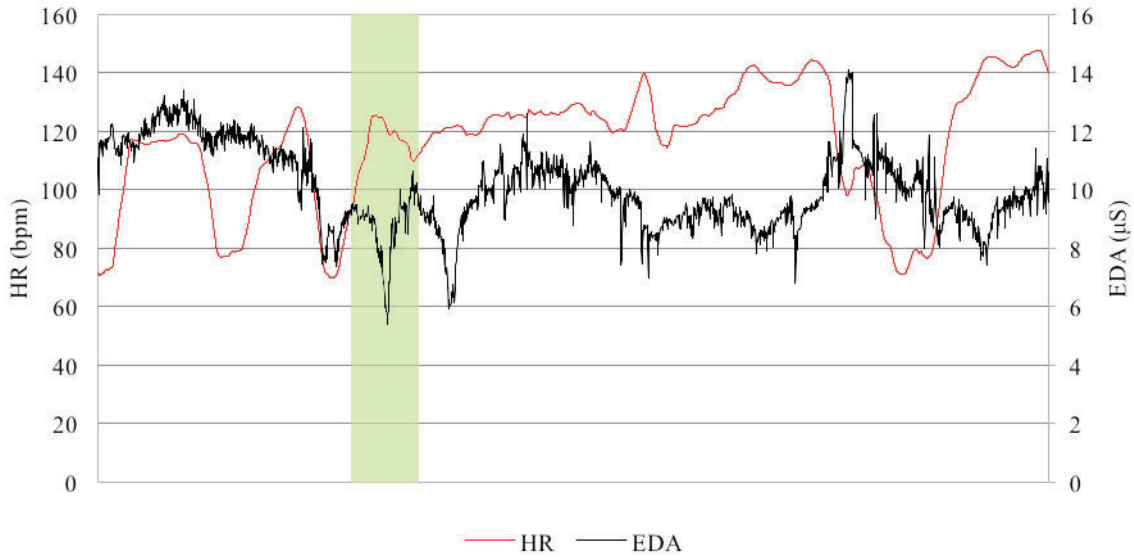


Figure 6.17: Owen's HR and EDA biodata – the highlighted area (which coincides with when he was walking along the canal) shows a decline in EDA with a simultaneous increase in heart rate. According to Kreibig (2010, p. 401) these readings would imply that Owen was experiencing sadness or relief. Since the skin temperature was constant (around 32.3℃) rather than declining as would be the case for sadness, Owen's data suggests he may have been 'relieved' when walking along this stretch of the canal.

[105]Another example of an emotion with cognitive content is disappointment.

Atmosphere

The notion of atmosphere is a crucial aspect of a therapeutic landscape; indeed, for Gesler (1996, p. 96) the "physical and built environments, social conditions, and human perceptions combine to produce an atmosphere which is conducive to healing". And whilst Gesler was not referring to NRT's conception of atmospheres in his work, the notion of affective atmospheres is useful for considering the immaterial and ineffable experiences of space. It is important to note, however, that the NRT conceptual of atmosphere, which is discussed here, is overall critical of the symbolic (B. Anderson, 2009) but using this theory allows the discussion to expand Gesler's consideration of 'atmospheres'. The notion of an atmosphere may be difficult to describe, but the NRT understanding of atmosphere gives form to diverse "structures of feeling" (Bissell, 2010b, p. 272) that can pervade all spatial scales, from an intimate space to a vast landscape (Anderson, 2009; Bille et al., 2015; Duff, 2016; Edensor, 2014). An atmosphere can be understood in two (interlinking) ways: meteorologically as "a turbulent zone of gaseous matter surrounding the Earth and through the lower reaches of which human and non-human life moves" (McCormack, 2008, p. 413), and as the *spatialisation of affective theory*. The latter has developed new understandings of the relationships between the (affectual) body and its surroundings:

> "[Atmospheres are] something distributed yet palpable, a quality of environmental immersion that registers in and through sensing bodies whilst also remaining diffuse, in the air, ethereal" (McCormack, 2008, p. 413)

Atmospheres, therefore, highlight how affect can be 'collective' and "form part of the ubiquitous backdrop of everyday life", yet are simultaneously "forceful and affect the ways in which we inhabit…spaces" (Bissell, 2010b, p. 272). Within geographical literature, however, there is an emphasis on the affective and ineffable qualities of an atmosphere, whereas an atmosphere is an entangling of an array of emotions, affects and sensations, the human and the non-human, matter and non-matter, and culture and nature (Duff, 2016; Edensor, 2014). Rather than just focusing on an atmosphere's affective qualities of an atmosphere, the focus is broadened to encompass the blurring of emotion, affect, and the body (cf. Edensor, 2014; Rose et al., 2010; Wetherall, 2012). This approach allows for a consideration of the material, sensuous, and corporeal dimensions of atmospheres to compliment the natures of affective experience (Bille et al., 2015).

Whilst the three areas all have their own unique atmospheres, there were specific spaces that had atmospheres which were particularly powerful. Warstone Lane and Key Hill Cemeteries

in the Jewellery Quarter, for example, both had an effect on the participants as Rebecca [Jewellery Quarter worker, female, 25-34-years-old] states:

> "I was more relaxed in the cemetery because it was really calming in there. There was this circular thing which was stepped down, there was a big tree in the middle so I wandered down into that middle and it was really quiet down there and there wasn't anyone else down there and because it was built up around the sides in kind of blocked out any background noise, it was just the slight wind through the trees. I was just slowly wandering around and it was a really calming atmosphere even though it was quite creepy with the catacombs" (interview with Rebecca, 18/08/16).

Figure 6.18: Video still from Rebecca's walk around the Warstone Lane Cemetery catacombs.

The Warstone Lane catacombs (Figure 6.18) were originally built because of an issue with the surface layer of the ground but provided additional capacity through the creation of a tiered burial site (Birmingham Jewellery Quarter, 2018; Jewellery Quarter Development Trust, 2017). Whilst the catacombs are closed to the public[106] it is still possible to wander around the outside of the structure and down in the excavated area like Rebecca did. In this

[106] The catacombs were closed in accordance with the Cemeteries Clauses Act 1847 and as a result of the emission of unhealthy air vapours (Birmingham Jewellery Quarter, 2018).

excavated area, Rebecca was subject to a particular unique atmosphere that included the 'creepiness' of the catacombs and the unique micro-environment created by the built-up perimeter in a space of solitude. This particular atmosphere, which was described as both calming and creepy, stimulated a clear psychophysiological reaction for Rebecca (Figure 6.19). When Rebecca was walking around the catacombs, she has a simultaneous decline in EDA and heart rate. These readings would imply she either felt sad or contented; the BVP data (which shows increased variation) suggests that Rebecca felt the latter (Kreibig, 2010).

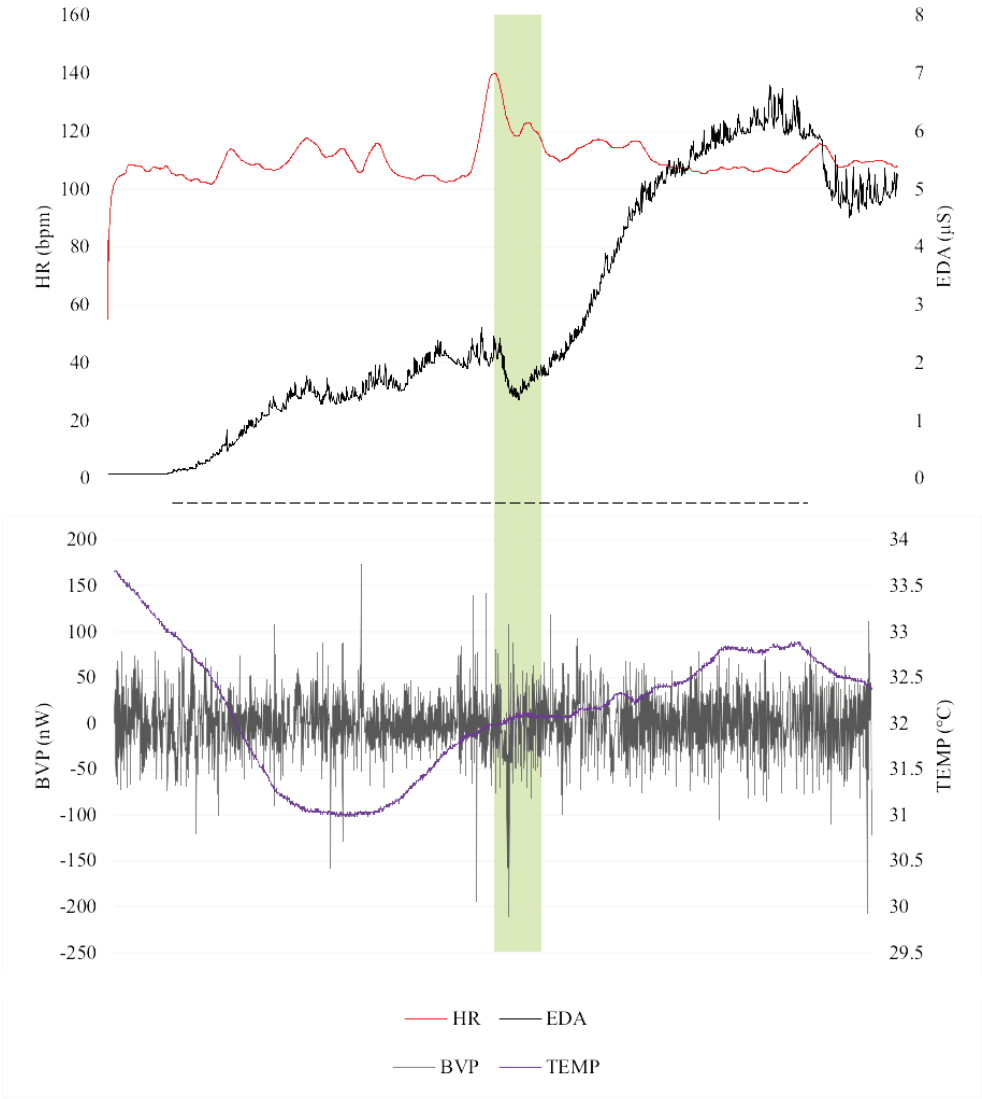


Figure 6.19: Rebecca's biodata – the highlighted area (which coincides with when she descended into the catacomb area of the Warstone Lane Cemetery) shows a simultaneous decline in HR and EDA and increased variation in BVP which would imply that Rebecca was contented (cf. Kreibig, 2010).

The catacombs demonstrate how the micro-environment, affective forces, and materialities combine to form a space which can stir a psychophysiological reaction. Crucially, however, the reception of the catacombs is subjective and whilst Rebecca was contented in that space, Amanda's biodata indicates psychophysiological deactivation and the possible experience of sadness with her obvious decline in skin temperature in the cemetery (Figure 6.20).

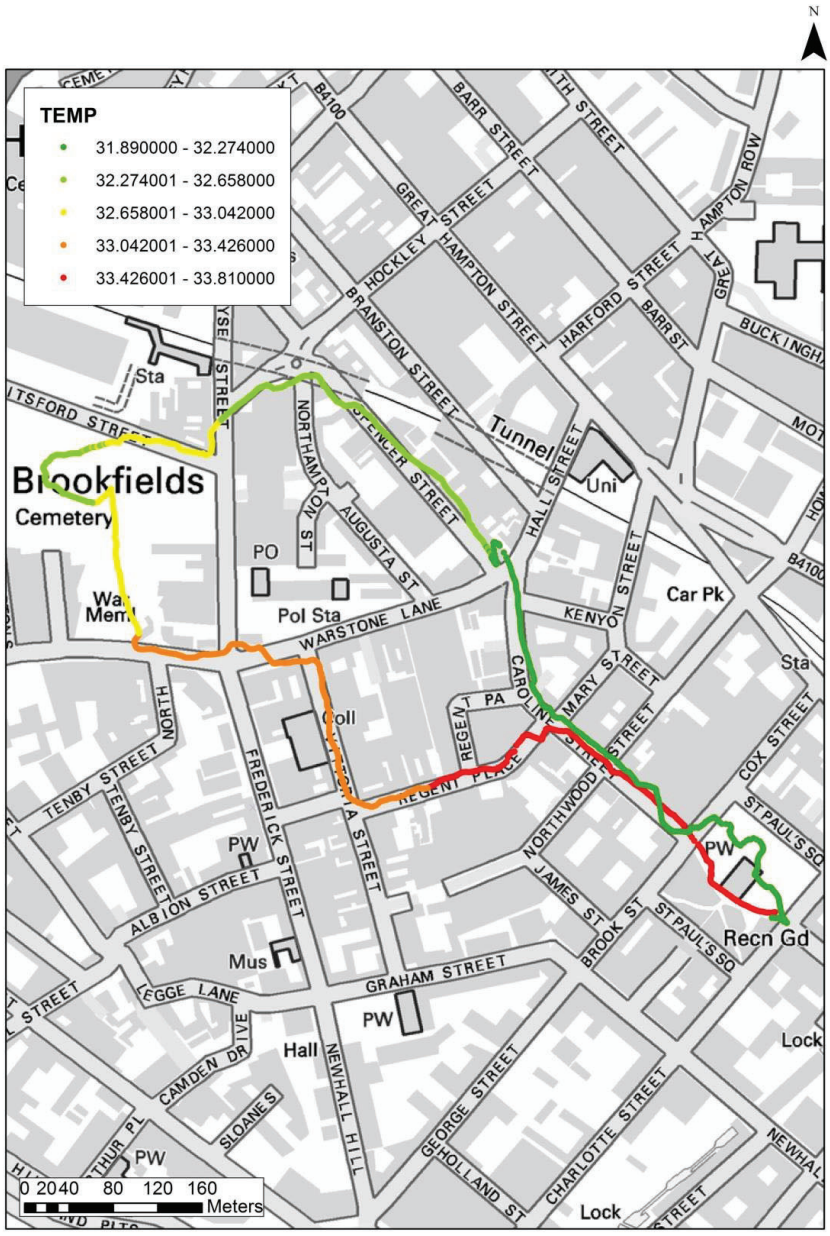


Figure 6.20: Amanda's TEMP map – note the decline in skin temperature when she is walking around the catacombs (north-western area of Brookfields Cemetery). A decline in skin temperature indicates a negative emotion (such as fear, sadness, or disgust) was experienced at this site.

The collection of human and non-human, natural and built, organic and inorganic features of the catacombs, which is supported by the affective atmosphere, all contribute to the lived sensation, the feel, and emotional resonance of a place. Whilst the unique feel of the catacombs was received differently from person to person, it still is an example of a 'thick place' in that the space enriches a person's sense of belonging and meaning through the creation of affective and experiential connection in place (Casey, 2001; Duff, 2010). It is this affective and experiential connection with and in a place that is a significant aspect of the restorative qualities of a space:

> "The feeling of harmony and connectedness produces a feeling of being part of this place, not just a visitor. The question of identity is highly intertwined with the experienced space. *This time ... is a source of well-being*" (Völker & Kistemann, 2011, p. 119 - emphasis added).

6.4 CONCLUSION

Through the use of an interdisciplinary biosocial approach, this chapter has demonstrated the significance of small/micro-spatial features of a space which stimulate noteworthy psychophysiological reactions. Using Völker and Kistemann's (2011, 2013, 2015) matrix of therapeutic spaces, this chapter investigated and expanded upon the experienced, social, and symbolic features of space rather than following the categorisations of urban space into green, grey, and blue which is commonplace in environmental psychology (and often health geography). In doing so, this approach was able to identify and discuss the smaller and more complex features of the environment that can stir a psychophysiological reaction. These discussions on experienced, social, and symbolic spatial features demonstrate which micro-spatial aspects of an environment (regardless of whether it is deemed a green, grey, or blue space) stimulate psychophysiological responses. Typically, the responses from this study support the findings and theorisations of previous research undertaken in environmental psychology, but, as a result of the innovative conceptual and methodological approach, were able to identify the specific spaces, events, and qualities that evoked a psychophysiological response.

Whilst mixed methods research is frequently used in research looking at salutogenetic spaces (see, for example, Bell et al., 2014; Foley, 2011), this chapter is the first example of the use of biosensors in geographical enquiry to investigate the restorative and stressful qualities of space. It has been shown how the use of biosensing technology can provide new knowledge about the perception (and reception) of the environment by an individual, especially when used in tandem with the visual and qualitative. Indeed, Michelle's fluctuations of physiological stress resulting from road vehicles along Salisbury Road would have only been possible to identify using the video, GIS, and biodata simultaneously. Since the chapter is rich with biodata, however, there still remains the risk that the participant's reactions to their surroundings will be objectified. This is extremely problematic when looking at social and symbolic phenomena and therefore there is a need to consider and utilize the participant's subjective accounts of their experiences in the environments.

Nonetheless, the interdisciplinary mixed-methods approach adopted for this study has been shown to be a very effective means to investigate the aspects of the environment that can relax and stress an individual. Indeed, this chapter primarily has developed upon the therapeutic landscape theory by moving beyond the broad categories of green, blue, or grey space and discussing the specific micro-spatial features of the three conservation areas that were either health-enhancing/restorative and health-limiting/stressful. This novel contribution is especially apparent in the discussion on experienced space where the biosocial methodology was able to identify and discuss the significance of flowing water, specific natural sounds, and the impact of passing heavily vehicles and pollution for the residents of Bournville, Moseley, and the Jewellery Quarter. Thus, this chapter suggests that environmental psychology should move away from their broadly holistic approach to health-enhancing/restorative and health-limiting/stressful landscape and consider what and why is causing those effects.

7

NOSTALGIA

Memory, as a research field is predestined for an interdisciplinary approach, since reminiscing has a biological basis yet consists of cultural and social events. As discussed in Chapter 5, the limbic system of the brain (namely the hippocampus) is key to the processing of memory and emotion and, as such, has been the focus of many cognitive scientific studies (Bannerman et al., 2004; Erickson et al., 2011; Maguire et al., 1997). The social sciences on the other hand, have tended to concentrate on the socio-cultural factors of memory: how public, social, shared collective memories shape people's understandings of space, place, and identity (Blunt, 2003; Hoelscher & Alderman, 2004; O. Jones & Garde-Hansen, 2012). Many of the social sciences have considered the emotionality of the memories, especially with the increased interest in nostalgia in recent years (D. Adams & Larkham, 2015; Bonnett, 2016; Bonnett & Alexander, 2013). Whilst the influence of NRT has considered the practice and process of memory at a bodily level, the biological factors of memory are yet to be fully incorporated into geographical inquiry despite calls to do so. This chapter, therefore, looks at the biological and social aspects of memory and emotion in tandem to create a bio-social account of nostalgia and how it shapes the body-landscape relationship.

Before discussing personal nostalgias, however, it is important to note that most events of nostalgia discussed in this chapter derive from childhood; the case study areas were the childhood homes of ten of the participants (25%) whilst a total of seventeen (42%) (including those ten) referred to their childhoods during the interviews. It is common for nostalgic narratives to incorporate childhoods since a memory of such time is "desired by adults for its innocence and the sentimentalized utopia of the middle class nursery" (J.

Moran, 2002, p. 157). Childhood memories often portray a time free from the pressures and stresses of adult life: a time of play and freedom, but also feeling loved and protected by family and friends (Harris, 2017). It is important not to solely concentrate on romanticised memories but appreciate that memories of childhood are multi-emotional and arise from an entanglement with the self across time (J. Horton & Kraftl, 2006). Furthermore, these memories are also subject to a degree of imagination and creativity, since one does not have the ability to remember every precise detail of past events (O. Jones, 2003; Kraftl, 2015a; Philo, 2003; Sibley, 1991). Nonetheless, the focus here is not what the memory *is* per se, but what it *does* to the body-subject, the environment, and the relationship between them.

7.1 PERSONAL NOSTALGIAS

Personal nostalgias can appear to be the most poignant of all types of nostalgia and can be stirred both involuntarily and voluntarily. For instance, these nostalgias can be "a smell, taste, a glimpse, that suddenly overwhelms us with regret and recalls us to some former moment. Here is the rush of feeling, the sudden, intoxicating cataract of memory" (Bonnett, 2016, p. 8). The sensory stimulation of an involuntary memory was common occurrence; for example, the smell of chocolate by the Cadbury Factory stirred this memory of Valerie's (Bournville resident, Female, 55-64-year-old) pencil case:

> "When I was little they used to have tours around the factory before Cadbury World and I remember that I was annoyed that I wasn't old enough to go. I think my brothers went and brought me back a chocolate tin. Everyone in school had these metal pencil cases from the Cadbury Factory … Obviously, it had some chocolate in and then loads of people in school had those as their pencil cases. Bizarre. I've got two and I don't know where the other one came from but it's just always been at home. Everyone had these tins" (interview with Valerie, 20/10/16).

Personal nostalgias, however, are not always involuntary and can be stirred intentionally. Indeed, many scholars have argued that nostalgia is a coeval of modernity (Boym, 2001; Fritzsche, 2002) that has been developed to combat the stresses of modern urban life detailed

in Chapter 5. Bonnett (2016, p. 6), however, argues that discussions around nostalgia need to move beyond a "scholarly 'common sense' … cliché", and study the "meaningful events, relationships or things" that nostalgia evokes in the subject. As such, the personal nostalgias discussed here represent the meaningful time-spaces of the participants.

The engagement with personal nostalgias, space, and emotion is approached in two ways. First, it discusses the way that space can evoke nostalgic memories that originally occurred in those spaces. Looking at spatially-stimulated nostalgia, we turn to the mattering of nostalgias where the nostalgia is retranscribed onto a space. Thus, mattering here refers to the placing of a memory to a space/object/thing that previously had no relationship to that memory. These two engagements with personal nostalgias demonstrate the two-way emo-memorial intra-action between the body-subject and space, which in turn, demonstrates space's emo-memorial affordance. This affordance, where the connection with the memory can be either direct or simulated, is the capacity of matter (including bodies, landscapes, objects, and space) to evoke an emotional memory in and from the body-subject.

Remembering in space

Many of the Bournville participants grew up in the area and reflected upon their experiences of childhood there. Of interest were the spaces of schooling and play, namely Bournville Junior School and the adjacent Bournville Park. Bournville Junior School sits opposite Bournville Green and is a major part of the community. Indeed, two participants worked at the school and eight participants were educated there. Consequently, it was a key aspect of the walks in Bournville and elicited many memories of school days despite how distant a memory they were for some participants. Schools are sites of play, myths, smells, sounds, and learning, and Bournville Junior School was no different: the wafts of "biscuits and baking" mixing with "the smells of little round discs of poster paint" (interview with Barry, 08/08/16) seeping throughout the corridors and classrooms. The classroom in the top of the Carillon Tower (bell tower), which was reserved for the Year Six (final year), was a highlight for one participant:

> "my class was right at the top of the belltower so that was really nice. It was a big classroom with glass windows on all sides. Music lessons were always in the tower as well so you could always hear music – that was

nice. It was a nice school to go to, the rooms were nice and big and airy" (interview with Rick, 01/08/16).

For Dan (Bournville resident, male, 18-24-year-old), the school and the adjacent park were special places of emotional memories:

> "I walked down Woodbrook Road and spent a little time here looking at the school exit. It was really nice, and then from there I came down into the park. This is basically the route I used to take walking to and from school. I used to come out of school here, walk down Thorn Road. It was really surreal actually … It just brought back a lot of memories with the sounds of the trees rustling and the brook. I don't often take the time to look at these things, you know looking into the school playground or walking the route you should take. Especially when I was a lot younger… it was very emotional, but a nice emotional experience. I remember pretty strongly those… at the school you had those little routines, like at the junior school we would always go to school via Bournville Park. I remember playing in the playground when I was in Years Five and Six and the Deputy Head always had to come to the park to get us to go to school and then after school it was always straight to the park to play football. That was just what we did every single day." (interview with Dan, 27/10/16).

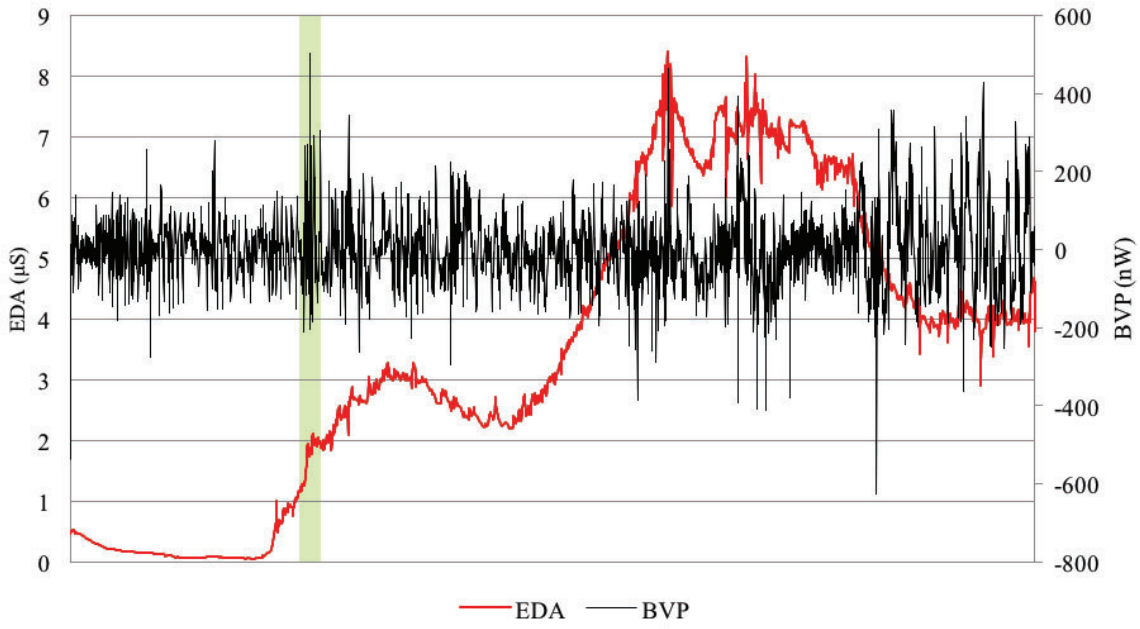


Figure 7.1: Dan's BVP and EDA biodata – the highlighted area shows increased fluctuation in BVP whilst maintaining a reasonably steady and low EDA compared to the rest of the walk.

The emotional nature of these memories is reflected in the emotional maps. Figures 7.1 and 7.2 demonstrate that around the site of the school and along the road to the park the participant was subject to increased fluctuations of BVP whilst maintaining a low EDA. This would imply that the 'flight-or-fight' response was initiated at that time, as during such a response hormones (adrenaline and noradrenaline) are released to increase blood flow to the muscles (Peper et al., 2007). However, it has also been found that the release of adrenaline and noradrenaline can enhance the processing of memory (Cahill & Alkire, 2003), hence there is the possibility that these high fluctuations in Figure 7.2 coincide with different memories, except for the single incident of exploration were 'flight-or-fight' would have automatically be activated due to the fear/unease of the unknown.

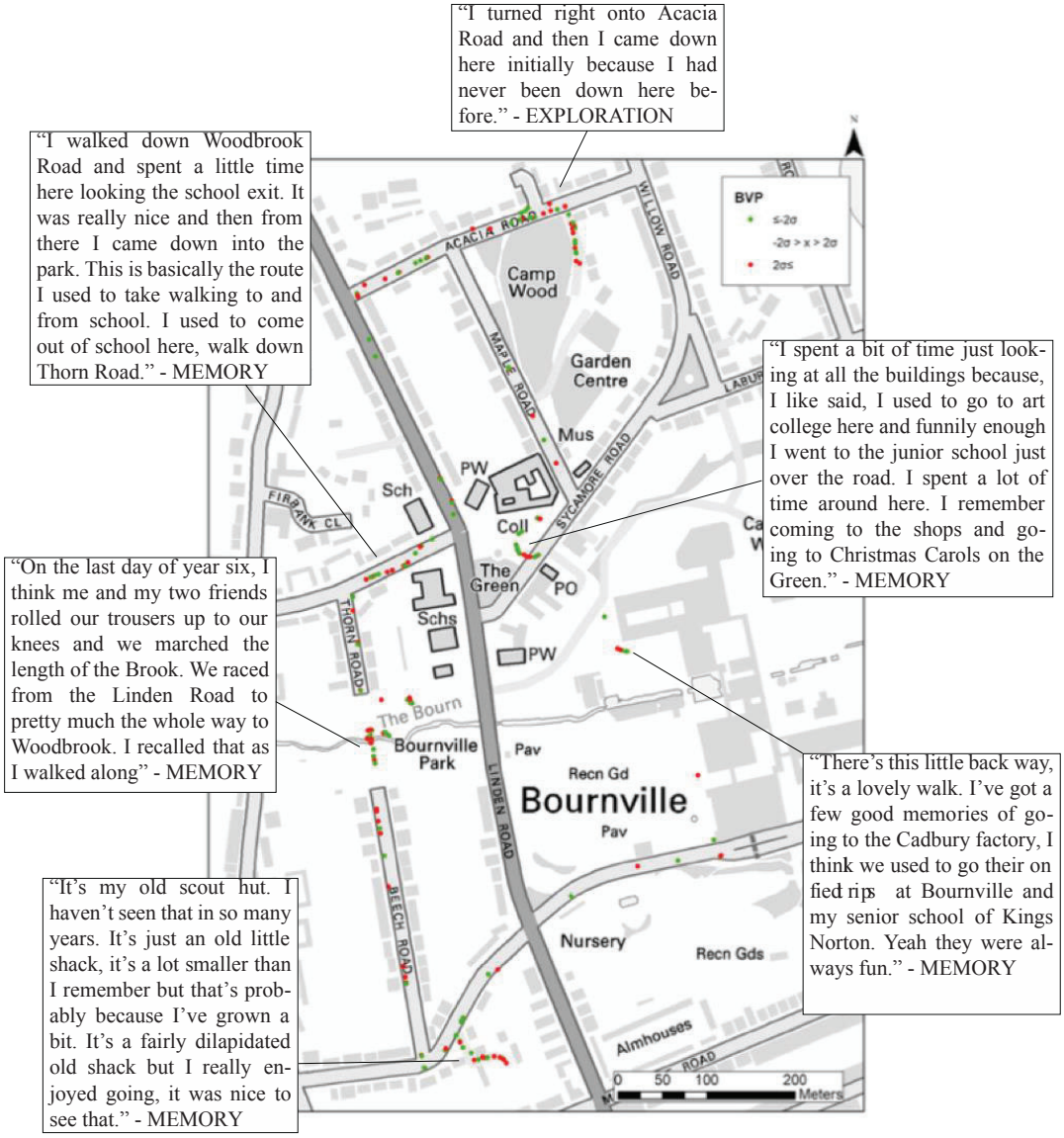


Figure 7.2: Dan's annotated BVP Map – extended periods of high fluctuations in BVP (shown by the green and red dots) are explained/qualified by the interview data about those specific spaces.

Returning to the space of Bournville Junior School, however, the quote demonstrates the unease that can arise from reminiscing. Dan's memories are a demonstration of Adam and Larkin's (2015, p. 2010) "untameable multi-sensory memories" that "strike back" (Muzaini, 2015). Crucially, these memories that were stirred by following his route home were a "nice emotional experience" that reminded him of happy times in his childhood.

Nostalgia, however, is a contradictory emotional experience: "a 'happiness' emotion, but with a bittersweet undercurrent of a past lost, never to be regained" (Harris, 2017, p. 20).

Hitherto this chapter has discussed the rose-tinted or positive aspects of nostalgia, but a feeling of loss is also a significant aspect of nostalgically reminiscing. For example, Jeff (Bournville resident, male, 55-64-years-old) reminisced about playing football with his sons and father when walking past the old Selly Oak Hospital Grounds:

> "These old grounds next to the hospice [used to be] open and they were playing fields right the way through back to the nurses home. And when my dad was alive and a lot younger [and] when my sons, who are 30 and 28 now, were young we used to go there and play football because you could just walk through the hedge and have a game of football. They would say "grandad I want to play football" and we used to go there. … [It's now] being built on as well so that's another building site and it was sad to see that site go. It's where I used to have fun and play with my boys" (interview with Jeff, 04/10/16)

As this quote and the biodata (Figure 7.3) demonstrates, this nostalgic account of playing football has a deep sense of loss. Whilst it is impossible to infer as to whether the recorded sadness was due to Jeff thinking of his late father or the loss of the playing fields, it is apparent that being near/in that space evoked the nostalgic memory, thus demonstrating the emo-memorial affordance of the landscape to stir a (re)action from Jeff.

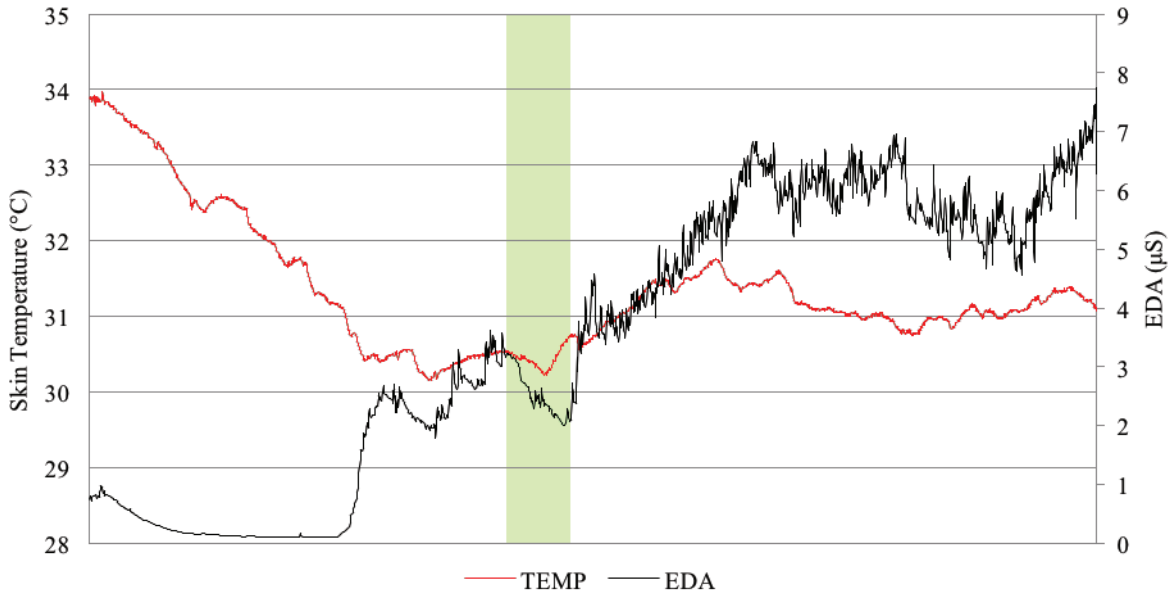


Figure 7.3: Jeff's TEMP and EDA biodata – the highlighted sharp decline in TEMP and EDA would imply that Jeff was experiencing sadness. This coincides with the time he was walking past former site of the Selly Oak Hospital (highlighted green).

Adults often regard childhood as the best time of their lives, as a time free of cares and worries, (A. Gupta, 2002; J. Moran, 2002); it is important to note, however, that childhoods are also a time of "little failures, disappointments, angsts, cock-ups, let-downs, faux pas, embarrassments, worries, regrets, hang-ups and instances of hopelessness" (J. Horton & Kraftl, 2006, p. 262). For instance, Rick [Bournville resident, male, 25-34-year-old] was remorseful for how he, as a child, treated the family pet when walking past his childhood home:

> "I remember we used have stairs as soon as you went in because we once threw the cat down the stairs to see if she landed on her feet. We were really young and we didn't really know what we were doing. But she did; she landed, threw up and ran off. We were told cats would always land on their feet so we picked her up and dropped her, she landed and then we held her above our heads, dropped her and she landed. So, the next logical step was down the stairs. To be fair I was four or five years old. I don't condone throwing cats down the stairs and I now feel terrible for doing that" (interview with Rick, 01/08/16).

These memories of regret shape the opinions of the person in the present. Indeed, regrettable memories often shape the person's identities. Indeed, Gillian Rose (1993, p. 19) argues that "identity is riddled with – and even formed through – mistakes, mis-recognitions, fantasies, … and relations of power". For example, when Julie (Bournville resident, female, 35-44-year-old) was walking through Bournville Park, she reminisced of going for a "crafty cigarette and maybe a little drink" (interview with Julie, 09/08/16) in her teenage years. She verbally expressed a regret for doing so and demonstrated an increase in stress when in that space (Figure 7.4). However, this regrettable experience has shaped how she perceives teenagers who are doing the same at the expense of school:

> "Julie: This goes against everything I just said but they will gather and it can be quite intimidating but there is nothing for the youth to do.
>
> Interviewer: Where do they gather?
>
> Julie: In parks, Rowheath, Bournville Park. I wouldn't say they cause any bother, I mean I used to do it and I wish I could again. I just think it's a shame but a big deal for the area really" (interview with Julie, 09/08/16).

Each of these episodes demonstrate one aspect of the emo-memorial intra-actions between the body-subject and space: how the landscape evokes nostalgic memories in the body-subject. Accepting that memories and nostalgia are brought forth through bodily engagements with the world, many geographers have demonstrated how the landscape itself can play an important role in evoking the past (Crang & Travlou, 2001; D. C. Harvey, 2015; Hill, 2013; Hoelscher & Alderman, 2004; Ingold, 1993). Indeed, as Ingold (1993, pp. 152–153) argues "to perceive landscape is … to carry out an act of remembrance", that such acts of remembering are not "a matter of calling upon an internal image, stored in the mind", but arise through being and engaging with "an environment that is itself pregnant with the past". Conservation areas are a landscape where the past is preserved and often exaggerated. These spaces (where the past is rife in the present landscape) demonstrate that places are not unitary in space and time, but that time differentially interrupts through place to blur past and present (Crang & Travlou, 2001). Whilst this section has concentrated on the mundane everyday nostalgic memories as opposed to the effect of the conservation strategies, there is a similarity between the blurring of past and present. This blurring, however, is not uncovered by the materiality of the area, but by the qualities of the memories where our understandings of our past changes retrospectively via new experiences that provide fresh meanings to our past experiences (Faimberg, 2005, 2007; Gentile, 2014; Stern, 2012). The vignettes presented here demonstrate how the past and the present are merged by allowing the past to provide meaning in the present and vice versa. Indeed, '*Remembering in space*' has presented how the present landscape can evoke memories of past landscapes and experiences; as such, we now turn to instances where the past is re-placed into the present landscape.

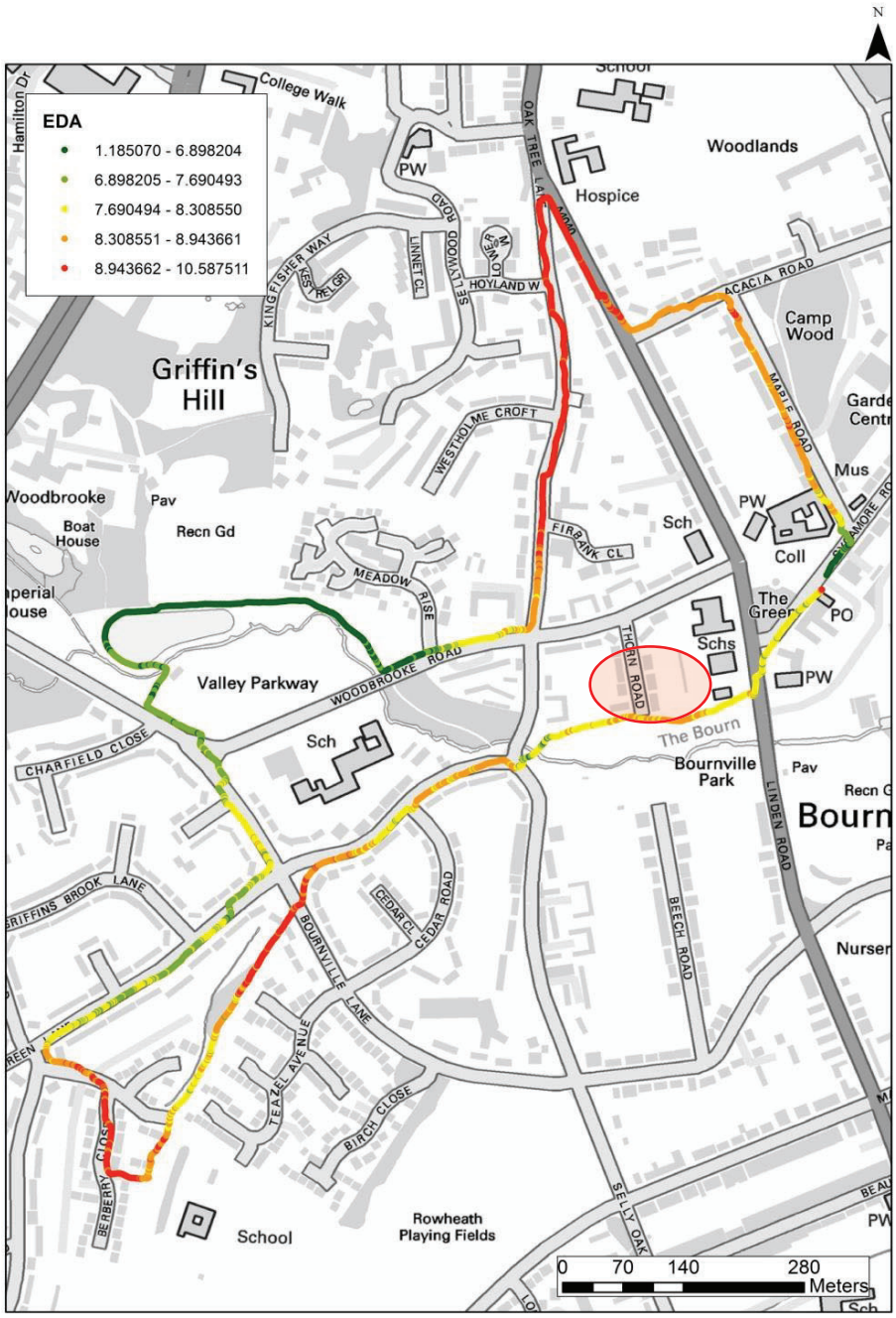


Figure 7.4: Julie's EDA Map with emphasis on Bournville Park where the EDA measure increases slightly around the area, she used to play truant.

The mattering of memories

Whilst it widely acknowledged that nostalgias combine a "sentiment of bittersweet loss and displacement [with] a romance with one's own fantasy" (D. Adams & Larkham, 2015; Bonnett, 2016; Boym, 2001), these discussions are typically of the same spaces where the memory is derived. Unlike the previous section, however, this section considers instances where nostalgic memories are re-placed, or mattered, into different space(s). This mattering

of memory differs from the practice of memorialisation[107]; instead these mattered memories are the practice of re-placing memories of the past onto the present landscape. Landscape is not a physical entity to objectively gaze upon; instead we ascribe meanings and memories to the landscape for intangible reasons (Ingold, 1993, 2000b; Ken Taylor, 2008). These landscapes matter; both in the sense that memories are imaginarily *mattered* to the physical landscape, and that this multiplicity of temporality in landscapes through the mattering of memory *matters* to the residents of the case study areas.

Terence, an 81-year-old who moved to Bournville in the 1970s with his wife, is a keen gardener. He lived in a three-bedroom bungalow with a very large garden until his wife's death in 2002 because he found the house was too physically and "emotionally demanding" (interview with Terence, 27/09/16) for him to live in alone. Since then, he has lived in a sheltered accommodation apartment in Bournville that does not have an adequate garden for his recreational needs. His close friend, 'Doleres', who following a bout of ill health was forced to move from Alridge[108] to a care home in Bournville, again without readily accessible green space. Consequently, they bought a plot at the Hay Green Allotment site together:

> "This is our plot on the left here and that's the shed I inherited … I don't have a garden where I live, well we do have a garden but it's not that big. It's nice but I can't do any gardening there like this and [Doleres] is equally in a new place and it's all very structured, nice garden but it's overlooked completely and we both enjoy the privacy of the allotment even though it's a shared place but we all know each other." (interview with Terence, 27/09/16)

Clearly this space matters to Terence and Doleres. It is a green space that is theirs; a private space for leisure and socialising which has great value for them. Terence commented that it is place where he feels the happiest: a comment that corresponds with his biodata from the walk, where he had an increase in skin temperature with a low EDA reading (Figure 7.5). The allotment site, however, has a double meaning for Terence. Not only is it a space which

[107] Memorialisation, as the preservation of memory/ies, is frequently discussed in geography (see, for example, Cloke & Pawson, 2008; Dwyer & Alderman, 2008; Forest & Johnson, 2002; Harrowell, 2015)

[108] Alridge is a large village situated north of Birmingham in the metropolitan borough of Walsall, UK.

he uses to socialise and relax, but it is also a space where he had ascribed memories of his childhood evacuations to Berkshire and Hampshire:

> "Although I'm a Cockney by birth, I was evacuated at the age of five. I mean I was born in 1935 so I'm 81 now and I first went to school in a village in Berkshire. So, I feel comfortable in the countryside and then I went back when the Blitz had quietened down and then I was re-evacuated to Aldershot, again the countryside and so on. So, I feel comfortable sitting in the countryside, and this is countryside to me" (interview with Terence, 27/09/16).

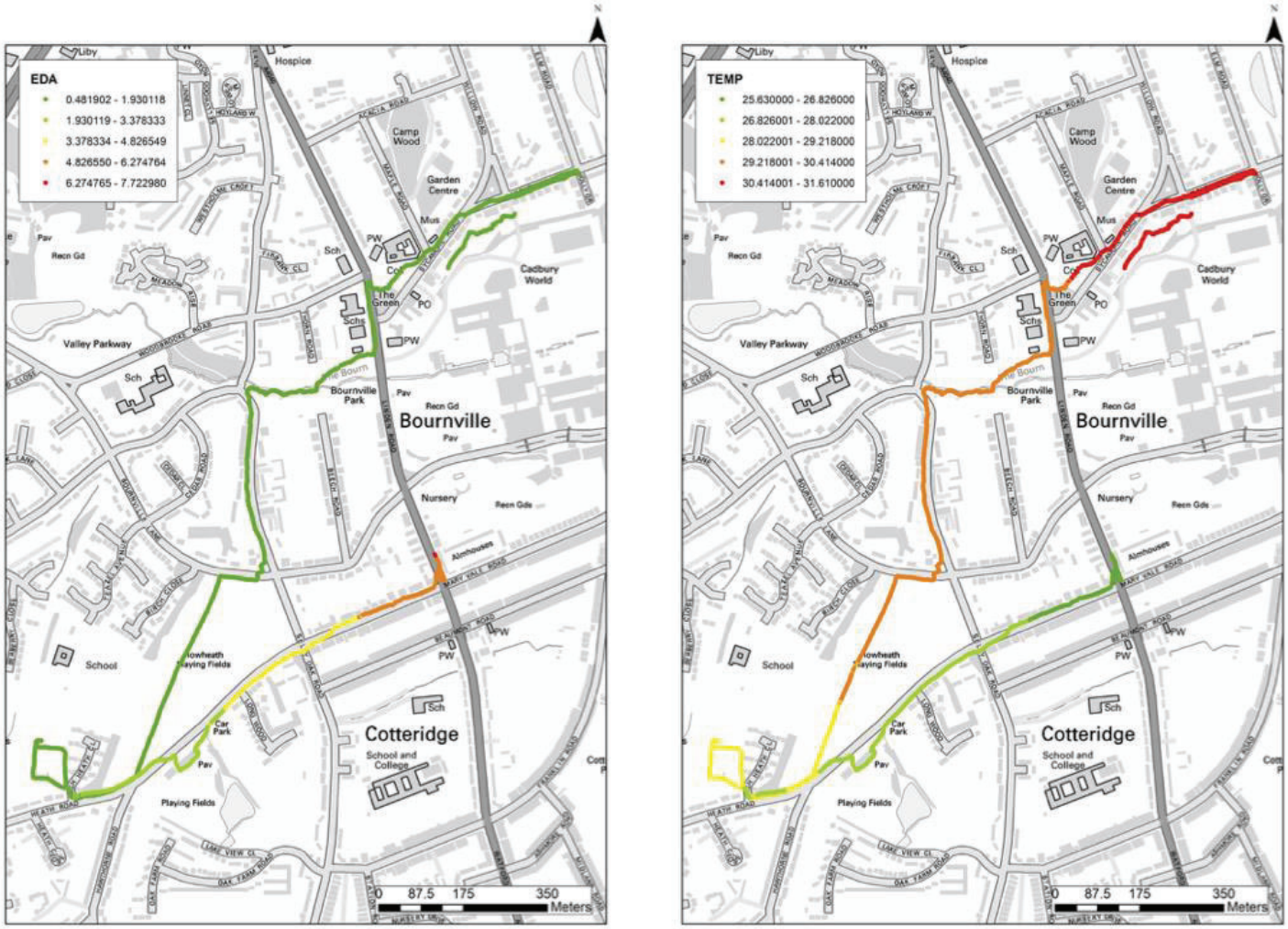


Figure 7.5: Terence's EDA and TEMP Maps – note the increase in TEMP and low EDA in the allotment site (south-west). These recordings would indicate a state of happiness (cf. Table 3.2).

Simply, Terence has created an imaginary that transcends time and space; it merges past and present, and two geographically different spaces. By mattering these memories of rurality to the allotment site, the landscape has an enhanced emo-memorial affordance that enriches his childhood memories, and his emotional connection with that place. Indeed, Terence's biodata (Figure 7.6, in addition to the maps shown in Figure 7.5) shows a decline in EDA and increase in HR, which would indicate that he was in a state of happiness. Crucially, this emo-memorial affordance creates a link between past and present in space where past experiences stimulate a 'new' meaning in the present social world. Or to quote Stern (2012, p. 55): "the past lends something to the present; and the present, by being linked to the past, keeps alive the continuous … growth and development of our histories".

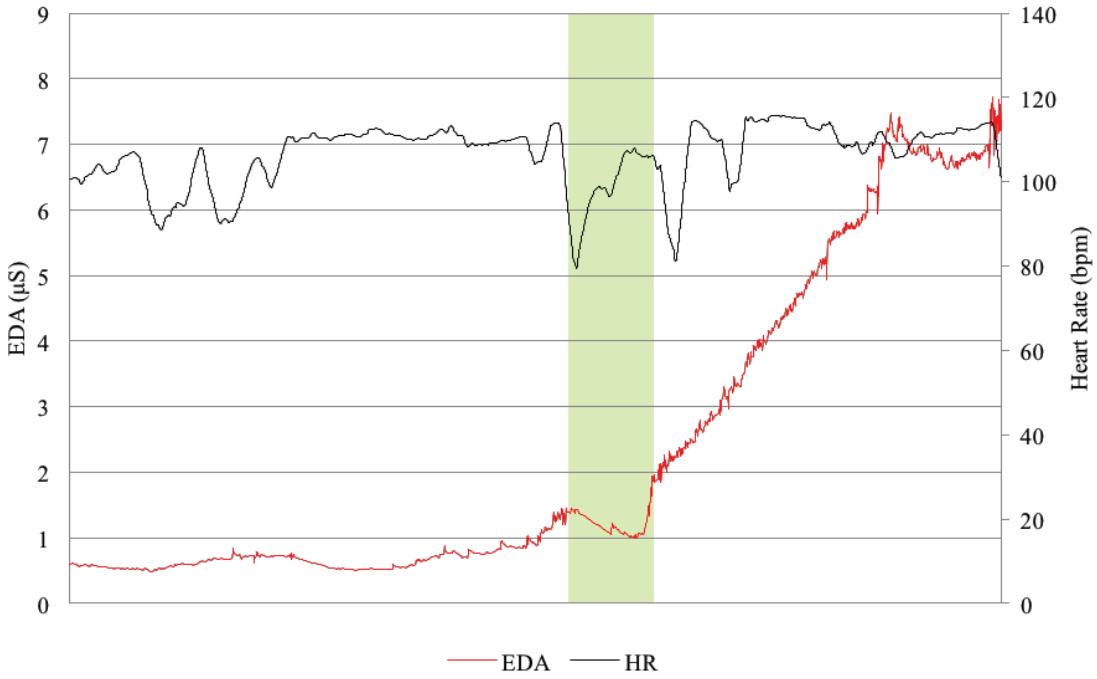


Figure 7.6: Terence's EDA and HR - The section highlighted green, which coincides with the time Terence entered the allotment, demonstrates a decline in EDA but also an increase in HR (between two sharp declines) which would imply 'happiness' (cf. Table 3.2).[109]

[109] Following the time in the allotment Terence rushed back to meet the researcher, which demonstrates the effects of exercise on the EDA measure.

This mattering of memory, especially when the memory is connected to a home, can be a very emotional experience. Indeed Maria (Jewellery Quarter resident, female, 18-24-year-old), who had ascribed memories of her childhood home to St. Paul's Square, found walking through the area a confusing experience of bittersweet happiness that was "nice but made [her] sad" (interview with Maria, 23/08/16). This experience was a mix of conscious and unconscious responses, whereby her EDA levels increased whilst walking around the Square, before declining shortly after (Figure 7.7). Maria, who grew up in Oldham,[110] moved to the Jewellery Quarter a couple of years ago and a week prior to the data collection process had returned to visit her family. As such, it could be argued that she felt conflicted between which area was 'home' for her. Indeed, she referred to both the Jewellery Quarter and Oldham as home in the interview. Regardless, the concept of home is a slippery multi-scalar process that encompasses materialities, social relations, and imaginaries (Blunt & Dowling, 2006, p. 2):

> "Home is … a spatial imaginary: a set of intersecting and variable ideas and feelings, which are related to context, and which construct places, extend across spaces and scales, and connect places".

For Maria, and the seven other participants who had moved into the area, their previous home still had a special resonance. For example, Monica (female, 34-45-year-old) chose to live in the Jewellery Quarter because it reminded her of Bristol, her previous home:

> "One of the reasons why I picked [the Jewellery Quarter] was because the first time I came here, the red bricks reminded me of Bristol. I am very nostalgic of Bristol because I lived in Bristol for seven years and I liked it a lot, and most of my good memories are from there. When I came here for the first time I thought that this is a place where it put me at ease because there is something to it that reminds me of Bristol. When I was walking, I was thinking about Bristol, some areas in Bristol, but I was thinking that Bristol is more beautiful than here. But still, I thought this is not too bad and it stirred a few memories of Bristol" (interview with Monica, 16/08/16).

Whilst Monica's conscious choice to live in the Jewellery Quarter is not an example of a person mattering a memory to the present landscape, it demonstrates the ways in which

[110] Oldham is a large town north east of the main metropolitan area of Manchester, UK.

longing for home *matters* and is "embodied and enacted in practice rather than solely in narrative or imagination" (Blunt, 2003, p. 722). When Terence is working in his allotment, Maria chooses to "sit, think, read, or whatever" (interview with Maria, 23/08/16) in St. Paul's Square, or Monica gazes upon the red brick buildings they are all evoking and performing a nostalgia of home: a time-space that brings them comfort, relaxation, and sense of place that is not a direct experience.

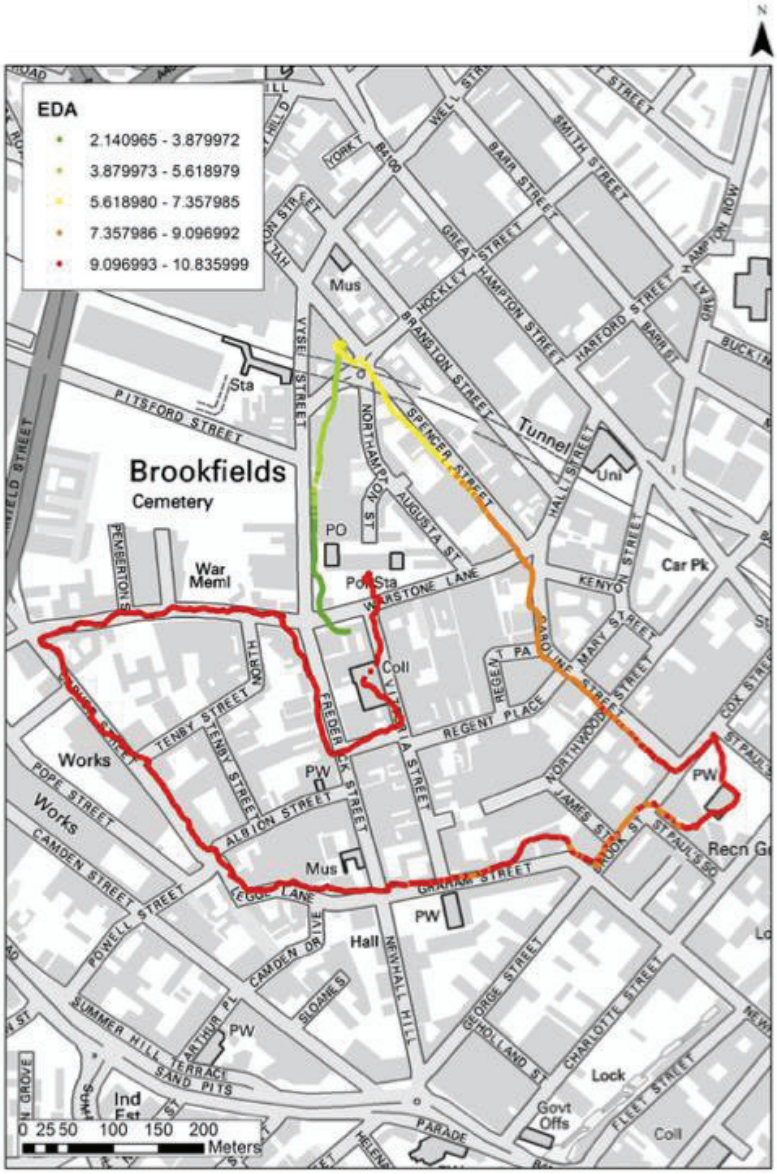


Figure 7.7: Maria's EDA Map – The track follows the pattern of EDA increase attributed to physical exertion (starting with green (low EDA) and increasing to red (high EDA)during the walk). Around St. Paul's Square, however, the EDA increases to red indicating (high stress) before declining as she leaves the area; thus, implying that an emotional event may have occurred there.

There are two possible (and interlinked) reasons for this process of mattering: creating a sense of place and coping with a sense of loss. The first is reflective of the positive aspects of nostalgia, where a person develops a sense of attachment or belonging to a location through the social construction of place. It is often argued that individuals who a have lived for longer in a location have a stronger feeling of place attachment than those who recently moved there (Hernández et al., 2007; Riger & Lavrakas, 1981) as it is more likely that the person will have more direct memories (such as those presented in '*Remembering in space*'). The emotive processes of memory are key to ideas of place (Cresswell, 2004, 2006):

> "Places are as much about time as space … Memory plays a crucial role in both these formations of place and the interconnects them. Memory forms one of the key ways in which spaces are temporal entities, but also underpins their spatial identities. Senses of place, belonging and dwelling all rest on memory within a location" (O. Jones & Garde-Hansen, 2012, p. 86).

Indeed, Doreen Massey (2005, 2011) has argued that a sense of place is not temporally still - it is not positioned solely in the present but blurs past, present, and future as a process between the subject and their surroundings. Not only does place transcend time but through the capacity of imagination, place can also transcend space. The episodes of Terence, Maria, and Monica presented here show that the creation of place attachment not only arises from direct memories but also re-places memories of a past time-space into the present environment. By re-placing memories of their past homes onto their new homes they are enhancing the present landscape's emo-memorial affordance to simultaneously enrich their memories and their emotional connections with that place: "to be inside a place is to belong to it and identify with it, and the more profoundly inside you are the stronger is the identity with the place" (Relph, 1976, p. 46).

The mattering of memory could also be interpreted as a coping strategy for the loss of the previous home. Within geography there is a great interest in experiences of displacement, diaspora, migration, and exile – how persons had to leave their home(land)s for a range of reasons, and how such displacements bring remembered absences to the new home landscape (see, for example, Blunt, 2003, 2005; Bonnett & Alexander, 2013; O. Jones, 2015; Ray, 1999; Tolia-Kelly, 2004, 2010). The beneficial functions of nostalgias are well

documented within the field of psychology[111] and many understand nostalgia as a coping mechanism for an experience in the present (or the recent past). Moving from one's home is often accompanied with a feeling a loss since the home is a central space in a person's social world (Blunt & Dowling, 2006; D. Porteous & Smith, 2001; Ray, 1999); by moving away, the individual loses their direct connection with home. Mattering the memories of a past home to the present landscape therefore allows the individual to cope with the loss of the past by blurring past and present and remember their home through the nostalgic practice of engaging in the landscape.[112]

Whether direct or stimulated, personal nostalgias are only a single framework within the ego-centric aspect of body-landscape relationship. Whilst it is the individual that remembers *sensu stricto*, work on memory within (and outside of) geography has demonstrated that memories can be shared among a collective through shared practice, performance, and material structures. These collective memories also have the capacity to (re)shape people's identities at various spatial scales and their relationship with space(s) (Halbwachs, 1992). Consequently, it is important to also consider what impacts collective nostalgias have upon the body-landscape relationship.

7.2 COLLECTIVE NOSTALGIAS

Just as nostalgia can be a private subjective feeling that is unique to the person's perception of the past, a group of people can have a collective nostalgic memory of phenomena (materialities, persons, or events) (Blunt, 2003; Bonnett, 2016; F. Davis, 1979). Whilst these

[111] Examples of the beneficial functions of nostalgia include coping with trauma (Frankish & Bradbury, 2012; Hertz, 1989) or loneliness (Wildschut et al., 2006; Zhou et al., 2008), personal growth (Wildschut et al., 2006), and social connectedness (Mills & Coleman, 1994), among others.

[112] It is important to note that remembering a lost home is not always an emotionally-positive experience. For example, in his paper '"Not Promising a Landfall…": An Autotopographical Account of Loss of Place, Memory and Landscape' (2015) Owain Jones physically struggled to write about the loss of his childhood home.

two types of nostalgia often overlap, the sociality of shared nostalgia is significant because it can enhance feelings of place attachment and belonging (Bonnett, 2016; Fairley & Gammon, 2005). Of course there are some collective memories (such as tragedies) that will not elicit feelings of nostalgia among a collective, but it has been suggested that some historical discontinuities (such as war, forced migration, depression, and natural catastrophes) will encourage nostalgia to soften the shock of a rapid change which a group has been subject to (F. Davis, 1979).

Additionally, collective nostalgia as an important means for the establishment of generations through the group's selection and integration of shared practices, attitudes, events, and scenes from the past that transform an age cohort to a generation of shared values. For example, Paula Harris (2017) compared childhood play practices between children and adults and demonstrated that adults felt that their 'generation' practiced more outdoor play as opposed to computer games. On this note, nostalgia also has the capacity to create a connection between generations when there are similarities in practices and events. In Bournville, for example, many people spoke of playing in the Bourn and were pleased to see present-day children doing the same:

> "I'm just wandering past the brook here and I was watching the kids jumping across it. It made me smile … it really did bring a smile to my face because I used to do that as a boy. It's nice to see that some things will never change" (interview with Alan [Bournville resident, male, 65+-years-old], 04/08/16)

Not only can collective nostalgia solidify identity, but it also has the capacity to invigorate social connectedness and provide a sense of meaning to the immediate environment (Routledge et al., 2012). Indeed, Probyn (1996) has argued that a sense of belonging arises from a longing for common histories and experiences among a group.

Because collective nostalgias are so closely tied to the theorisations of collective memory, it is important to consider that some of these feelings of shared nostalgia can be influenced, or manufactured, by those in a position of power who want to create a collective identity or sense of place (D. Adams & Larkham, 2015; Batcho, 2013). The most discussed, and perhaps the most obvious, form of influenced nostalgia is that of national identity where shared histories are solidified through the use of tangible memorialisation (Nora, 1989, 1998) and intangible repeated practice and performance (Munjeri, 2004; L. Smith &

Akagawa, 2008). A number of commentators have argued that measures are implemented to employ techniques of 'imagineering', including memorialisation, museology,[113] and inventing traditions, to evoke nostalgia for the past and spatialise specific collective memories (Crang & Travlou, 2001; Edensor, 2005b; Kohn, 2012; Massey, 2011; Rose-Redwood et al., 2008; Wesener, 2016).

Shared feelings of nostalgia

As demonstrated in Chapter 4, Bournville (unlike Moseley and Jewellery Quarter) was created *ex nihilo*. As a representation of George Cadbury's paternalist living ideals that is maintained by the urban conservation initiatives and the work of the BVT, Bournville could be considered as an example of an invented tradition, as Matthew (Moseley resident, male, 45-54-year-old) argues:

> "There was nothing there and then the Cadbury factory was built and they basically built a village from nothing. Like Kings Heath there was a village there, Moseley there was a village there and so on. But there was nothing in Bournville so they built it from scratch as the ideal of an English village … But it's best optimised by the village fete which is like they got the book of how to run a village fete hundred years ago and have obeyed that book every single year. So, they have the maypole, whereas all the other village fetes reflect the community that live there. You know the Kings Heath one or the Northfield one. They are just an utter mess of chaotic nonsense which reflects the interest group and everything going on. Whereas Bournville have this vegetable growing competition, it's that sort of John Major's nostalgic 'this is England' ideal. And I think that reflects the area as well or the vibe of Bournville village because it has no history apart from the history it's been told to have" (interview with Matthew, 05/12/17).

An invented tradition, defined as a "set of practices, normally governed by overtly or tacitly accepted rules and of a ritual of symbolic nature which seeks to inculcate certain values and norms of behaviour by repetition which automatically implies continuity with the past" (Hobsbawn & Ranger, 2012, p. 1), is not a new creation nor a pure act of social constructivism. Instead, it builds upon a sense of lost community and cohesion to offer a

[113] Museology refers to the practice of managing and curating museums (Graham et al., 2016).

comforting collective script for individual longing. Boym (2001) consequently argues that invented traditions are an example of restorative nostalgia: a nostalgia that fills the histo-emotional gaps through the (re)construction of a lost home. Indeed, Cadbury moved all his employees from the city centre to the new (countryside) site to the south (Bryson & Lowe, 2002). Whilst it is impossible to determine whether the invented traditions encouraged by Cadbury where intended to fill the histo-emotional gaps of their lost home or not, the invention of tradition has the capacity to create shared histories and experiences and a consequential sense of belonging.

Bournville is an area that has a plethora of invented traditions, from the Village Fete (discussed in the quote above) to the importance of gardening. I am uneasy using the term 'invented traditions' about Bournville; whilst I am aware that the majority of traditions were established by George Cadbury and maintained by the BVT, the repeated performance of traditional practice over the decades transforms an invented tradition into a genuine tradition. Indeed, Handler argues a distinction between genuine and invented traditions is "untenable because all traditions (like all symbolic phenomena) are humanly created ("spurious") rather than naturally given" (1984, p. 1026). The Bournville Village Fete, through the community's repeated engagement, started as a spurious tradition (i.e. "the village fete which is like they got the book of how to run a village fete hundred years ago and have obeyed that book every single year") but became a genuine tradition through the repeated practical and embodied engagement (i.e. "it reflects the area … because it has no history apart from the history it's been told to have"). As such, the invented traditions established by George Cadbury have now become traditions in which the residents achieve a sense of belonging through their practice to the extent that Annie (Bournville worker, female, 45-54) was worried that her children's children will not be subject to the same experiences she had going to the fete:

> "Annie: [Bournville Village Fete] is but not as much as it used to be.
>
> Interviewer: In what way?
>
> Annie: Well since it [Cadbury Factory] has been sold, it wasn't even Kraft,[114] it was before that.
>
> Interviewer: What's happened?

[114] The American conglomerate Kraft Foods Group Inc. bought a majority share of Cadbury UK Ltd. in 2010 (Dorfman, 2010).

> Annie: It's become more corporative, it's more business focused. When before, it was a business still, the idea was to make a profit, but now they are clawing at everything, even the Bournville festival doesn't appear have as much money spent on it. It's still good, but it's the people that make it good. Cadburys provide a lot of it but it is the people that go there that makes it special. There is still the same amount of people, but there is less input from Cadburys. The people have put more into it, you can tell. But it's less elaborate. You can tell it's changed. […] I'm worried [because whilst] my children have some of the same memories but my children's children won't if it's all sold off and eroded" (interview with Annie, 08/08/16).[115]

Although the Bournville Village Fete (and other Bournvillian traditions[116]) may have started as invented traditions, the repeated practices of attending and engaging in them creates an emo-memorial entanglement between the individuals, others, and place where the repetition, and consequential memories formed, of each event create multi-faceted layers of nostalgia that build onto the next event. These traditions, therefore, are "suffused with a sense of sensual, emotional, and affective belonging that is embedded over time through repetitive practical, embodied engagement" (Edensor, 2012, p. 1106).

Whilst Annie and other Bournville residents are beginning to worry about a distant loss, some Moseley residents have a shared feeling of loss. In the 1970s, due to the cheap accommodation in area, many artists, young professionals, and students moved into Moseley and established it as a cosmopolitan and creative area (Fairn, 2004). This has been one of the factors that has led to gentrification in the area and turned it into one of the most of affluent suburbs in Birmingham (Dyckhoff, 2013; P. Williams, 1984):

> "Moseley is a classic gentrification area in the sense that it used to be a big hippy cheap bohemian proto-hipster type place. You know your classic Guardian reading people who would buy a big house because it's cheap and raise their kids in an alternative way. I used to know people who grew

[115] Practice and performances such as this are examples of living heritage – aspects of the past which are maintained or performed by the present population.

[116] Other Bournville traditions listed by the participants included gardening and growing your own fruits and vegetables, school trips to Cadbury World, and watching cricket on the recreation grounds, among others.

> up around here and they did grow up in these big houses with these hippy parents and it's great! You know this whole north London kind of vibe happening in Birmingham. […] So, it used to be where all the alternative people lived and weirdos went, you know university professors and that. Partly because it was cheap but also weird and nice. […] it becomes desirable and the middle classes move in and then everyone else moves out and you end up with this sort of thing it is now." (interview with Matthew [recently moved from Moseley, 45-54-years-old], 05/12/16)

As Matthew demonstrates, the gentrification process that has occurred in Moseley has priced out many of the people who developed Moseley's 'bohemian' character. Indeed, some of the artistic community who took part in this research (including Matthew, Michelle [Moseley resident, 35-44-years-old], and Ed [Moseley resident, 45-54-years-old]) commented upon how they felt as if they were being priced out the area. Whilst not exclusively, this loss of younger, artistic, and 'proto-hipster' people has changed the character of the area. Indeed, Esther (Moseley resident, 45-54-years-old) commented:

> "Housing has become more expensive and that has driven a lot of the people and the younger people that used to live here out. I think that has changed the character […] it's changing, it's 'prettyifying' and you can see that it's becoming a place for the café society and dining out, not an edgy artistic community like it was" (interview with Esther, 07/12/16).

Although this sense of loss for a diminishing younger, artistic, 'proto-hipster' and bohemian community and character may not be shared throughout all Moseleyites (since some of the newer residents felt that the area is still bohemian), it can still be interpreted as a collective nostalgia since those who commented upon the loss of bohemianism still reflected upon that past fondly. For example, Emily (Moseley resident, 35-44-years-old) reminisced of her student house which she shared with other students and artists in the 1990s:

> "Emily: I then went onto Park Hill. I used to live on Park Hill, not for very long. So, it was interesting to go back there again.
>
> Interviewer: Why?
>
> Emily: I'm not a nostalgic person generally but I was taken back to that time. It was a really good time. I lived there when I was twenty and it was quite a party house and it was interesting to see that bits still look the same" (interview with Emily, 05/12/16).

Walking down Park Hill therefore stirred feelings of nostalgia for Emily as she responded positively to memory of her time as a student and living with other members of the 'bohemian' community (demonstrated in both the biodata (Figure 7.8) and the quote). Although this episode is an example of direct personal nostalgia, it still demonstrates the value that some Moseleyites ascribe to that time in the area's history.

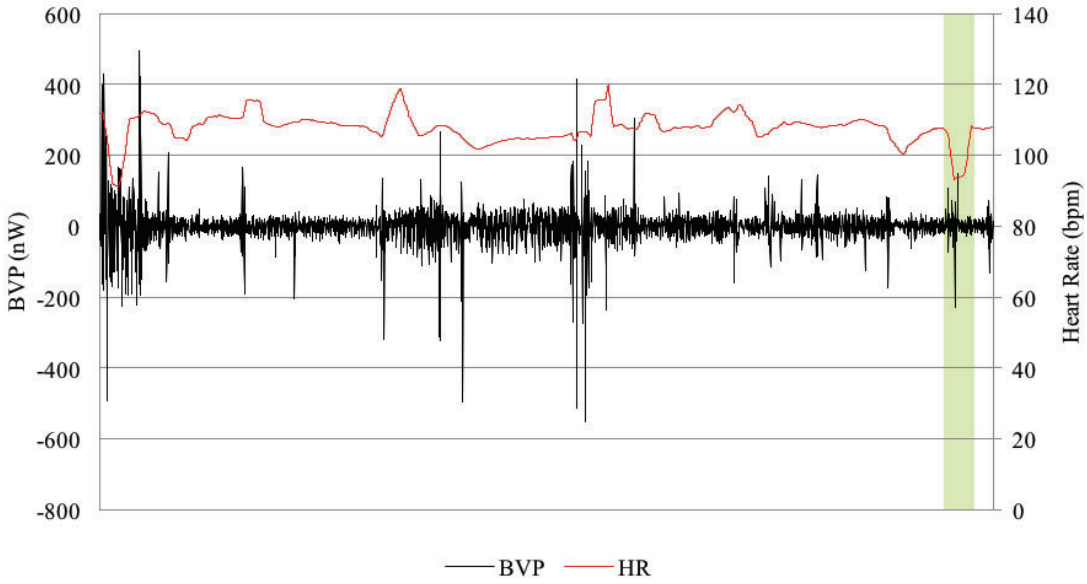


Figure 7.8: Emily's BVP and HR biodata – the highlighted area displays increased variation in BVP (implying the memory is being processed - cf. Cahill & Alkire, 2003) and a sharp decline in heart rate. Combined, these readings (along with the low EDA recording at that time too) would imply that Emily reminisced of a time which brought her a sense of ease, or possibly happiness.

The most apparent form of collective nostalgia is national memory which is demonstrated by the reification of memory with sites of memory. Indeed, Stephen Legg (2004, 2005) has argued that Pierre Nora's (1989, 1998) theorisations of *lieux de mémoire* promotes a nostalgic view of the past as opposed to authentic memory (also see Till, 2008). The notion of collective nostalgias here, however, has focused on the shared feelings of nostalgia (regardless of whether they were invented/manufactured or not) to demonstrate the importance of the local regarding place attachment and sense(s) of belonging: "nostalgia … is one of mankind's most shared emotions. It's one of the things that makes us human" (Miyazaki 2002 in Bonnett, 2016, p. 11). A significant aspect of belonging is to *be longing* for shared histories and experiences within a community (Probyn, 1996). Hence why the Bournville residents expressed concern for the loss of shared experiences at Bournville

Village Fete between generations and some of the Moseleyites had a shared feeling of loss regarding the exodus of bohemian residents. Thus, these two examples demonstrate both sides of nostalgia, a happiness that combines with a sense of loss, but also how the sociality of nostalgia can enhance feelings of place attachment and belonging.

Regardless, the romantic nature of nostalgia has resulted in its continued unsympathetic understanding and interpretation in the humanities, who view the phenomenon as a regressive and naïve longing for a lost time that acts to work against modernity and progress (Pickering & Keightley, 2006). As such, nostalgia can be understood as an ideologically exploitable concept; a tool to selectively manipulate the urban and social environment (D. Adams & Larkham, 2015; Batcho, 2013). The material environment is often used to generate a collective narrative of the past because of its perceived permanence and stability. Indeed, when a community's memories are mattered into the built environment, it can be argued that they gain a sense of timelessness (Connerton, 1989; Nora, 1989).

Material structures

Bournville, Moseley and the Jewellery Quarter, as urban conservation areas, represent a *lieux de mémoire* on a much larger scale than Pierre Nora (1989) originally described. These areas encompass a collection of listed buildings and memorials (including statues and blue plaques) each with their own narrative of the past. These materialities combine to create a narrative of the whole area which, in turn, forms a framework of collective memory. In particular, Bournville and the Jewellery Quarter each have a strong area narrative (paternalistic model village and industrial powerhouse, respectively) which are enhanced and maintained by materialities of those areas. For many residents of the Jewellery Quarter, the various museums were a place of interest:

> "[The Jewellery Quarter] is unique. I like its buildings, I like its history of being the workshop of the world. I do visit the coffin works quite often as well and because the open studio is there as well it has always been part of my life in some way. I know the museums like the Coffin Works and the Pen Museum … oh and the Assay Office. I love that it was the workshop of the world – it was very industrialised obviously but it's what makes the Jewellery Quarter the Jewellery Quarter. It's our past" (interview with Christina, 02/08/16).

This quote demonstrates how the museums, whilst preserving and celebrating a history, spread into the area to form the area narrative 'workshop of the world'. Whilst a great deal has been written on the role of museums in the processes of urban regeneration (see, for example, Heidenreich & Plaza, 2015; Plaza & Haarich, 2009; Vicario & Monje, 2003), the way that the museum's narratives, along with the conservation orders, diffuses into the surrounding area to give the area a narrative or character. Not only does the Jewellery Quarter's distinctive character encourage tourism, it also creates a "link with the past and the continuing tradition of a lived-in environment" that establishes a "feeling of intimacy" between community and environment (Orbasli, 2000, p. 45).

Clearly, collective memory, whilst being a socially produced phenomena (Halbwachs, 1992), is elevated through technology (such as film), physical monuments, museology, and the preservation of architecture: "the word in stone" (R. R. Taylor, 1974). As such, it can be argued that the materialisation of memory is bound to notions of power, culture, and economy (Graham, 2002; Graham et al., 2016): "Monuments are nothing if not selective aids to memory: they encourage us to remember some things and to forget others." (Ladd, 1997, p. 11). Many of the participants spoke of Golden Square as an example of the Jewellery Quarter's past and future:

> "I like Golden Square, I think its quite modern but it's not in-your-face modern. It's not modern for modern's sake. They've got the … like a rust effect plaque running through it; it's all nicely paved, and there is some green so it's like St. Paul's Square in a sort of way." (interview with Rebecca [Jewellery Quarter resident, female, 25-34 years-old], 18/08/16).

The Square was designed to commemorate the area's past; for example, fruit trees were planted as part of the Square in order to memorialise the small houses and orchards present in that space prior to industrialisation (Holyoak, 2016a; T. Osborne, 2017). The Big Peg, which is situated adjacent to Golden Square (Figure 7.9), represents a different history, however. The Big Peg was built in 1969 following the bulldozing of terraces of jeweller's workshops - whilst the flatted factory was intended to provide a new premises for the jewellers that had been misplaced, the rent was beyond most jewellers (Holyoak, 2016a). Currently, the Big Peg is the location for various small businesses including multimedia, search engine optimisation (SEO) consultants, and IT solutions companies, thus demonstrating that certain pasts can be forgotten through changes in the material environment yet attempts to revive recent pasts can be made.

Figure 7.9: The Big Peg and Golden Square, the Jewellery Quarter.

Bournville Green, on the other hand, is a space purposefully designed to have a long history despite being built around 100 years ago. Indeed, Alan (Bournville resident, male, 65+ years-old) commented that the Bournville Green area has "fake tradition and fake heritage" (interview with Alan, 04/08/16). This fake heritage is epitomised by Selly Manor (Figure 7.10), situated adjacent to the Green, which is a Tudor building that was moved to the area 'brick-by-brick' over seven years (Selly Manor Museum, 2017) in order to preserve the building but also create a sense of heritage in the immediate area.

Figure 7.10: Selly Manor (from Bournville Village Trust, 2017b)

Whilst the grand spectacle of material heritage, or "monumental seduction" (Huyssen, 1996, 2003), may seem to provide a linear narrative, as Brian Ladd argues, it contains the interplay of the 'fixed' (monument, stage, building etc.) and the 'mobile' (commemoration, ritual, performance, etc.) (K. Mitchell, 2003).[117] This interplay between 'fixed' and 'mobile' heritage allows for material (whether a listed building, museum, or monument) to be re-coded over time by the experiences and interpretations of the users (Graham et al., 2016). Although George Cadbury designed Bournville to imitate an old British village, many residents, such as Alan, acknowledge that the heritage is 'fake' but through their own engagement with those material heritage sites have recoded them:

> "I went on school trips there when I was little and also I've taken the children there when I was teacher. … I have a lot of friends who don't leave in Birmingham and whenever they come I take them to Selly Manor because it's part of the history of Bournville. It's that kind of building really and the fact that it's moved brick by brick there is always interesting as well" (interview with Mike [Bournville resident, Male, 25-34-years-old], 15/08/16)

Mike's account of Selly Manor identifies how the fake heritage has now become an 'interesting' aspect of his connection alongside his personal experiences of going as a child and with children. Indeed, many of the Bournville residents referred to their memories of children playing at Selly Manor:

> "I went over to Selly Manor and Minworth Greaves. Really most of my memories here are from my children here. They used to do day events with face painting and the like. All the years it was here I never came here as a child which is really strange. It's great for kids and it has loads of stuff for them." (interview with Annie, 08/08/16).

Selly Manor hints at the complex entanglement between personal and collective memories, (invented) traditions formed through the material and immaterial, and the emo-memorial affordances that occur in conservation areas. Specifically, the (often prescribed) narratives of the conservation area (such as British country village or industrial powerhouse) blur with the personal and collective memories of the residents to form a complex entanglement of embodied socialitities, spatialities, materialities, emotionalities, temporalities, and corporealities of memory in space.

[117] 'Fixed' and 'mobile' are also understood to be 'tangible' and 'intangible' heritage respectively.

7.3 CONCLUSION

Using a biosocial account by combining the biological and social aspects of memory and emotion, this chapter has demonstrated the various ways in which nostalgia and landscape are entangled at both a collective and individual level. The episodes of nostalgia were shown to be bittersweet: a fondness or happiness from the memory but with an undercurrent of loss since that time can never occur again. At the individual level, it was shown how the affordances of the environment can evoke episodes of nostalgia, including memories of childhood or activities with now-deceased family members. Alternatively, an individual can matter their memories to a geographically different landscape to produce an emotional connection that transcends time and space. Whilst it is impossible to determine whether this process of mattering memories is a coping mechanism or a means to enrich a person's sense of place, this process of mattering memories blurs the landscapes of past and present and remembers the person's home(s) through the everyday, yet nostalgic, practice of engaging in the landscape. Looking at nostalgia collectively, on the other hand, has demonstrated the social value of shared longings. Whether this shared longing (or even loss) is between a generation or a neighbourhood, it has been shown that it is significant to an individual's sense of belonging both socially (Probyn, 1996) and spatially to the area.

Jones and Garde-Hansen (2012, p. 87) argue that for people who live and work in an area, their immersion and connection to the landscape is "temporal and memorial as well as performative, embodied and spatial", and whilst this chapter demonstrates that, it is shown to be socially significant too. Nostalgia, and nostalgic practices, have been shown to enrich a person's sense of place and their sense of belonging within the physical and social environments. Crucially, the processes of nostalgia have been demonstrated to be very emotionally rich; not only in how experiences of nostalgia can stir the body, but also how they can have a major influence on the relationship between the body-subject and the environment. The processes of nostalgia and nostalgic practice can enrich an individual's connection with their immediate environment where the entanglement of the body and landscape establishes an emo-memorial flow between imaginative bodies and the evocative landscape to enrich a person's sense of place and belonging with others who have had that

experience. Indeed, and as Probyn (1996) argues, a sense of belonging is to be longing for shared experiences and histories with others around you.

Being nostalgic or being subject to a moment of nostalgia is a moving experience in that it both stirs a bodily (re)action, which was effectively identified using the biosensing technology. Typically, methods that are adopted in studies of memory and nostalgia include auto-ethnography (J. Horton & Kraftl, 2006, 2012; O. Jones, 2015), oral histories (Andrews et al., 2006; Llewellyn et al., 2017), textual analyses (Maddrell, 2012), and interviews (D. Adams & Larkham, 2015; Loveday, 2014). These approaches have been shown to be extremely effective in researching the role of memory in identity, space, and place. These qualitative engagements with memory, however, tend to focus on the what of the memory. This chapter, however, by incorporating biodata and mobile video ethnography, has approached memory in an innovative way by considering the bio-social embodiment of memory, its affects, and its connection with the environment. Nevertheless, it could be argued that the use of biodata in this chapter is limited especially when compared to the interview data. Indeed, unlike the previous chapter, this chapter has presented more of the textual data to unpick the role of nostalgia in the body-environment relationship. Memories are stories of an individual's past, and thus are more effectively uncovered and presented as textual data. Regardless, the use of biosensing in this chapter has provided additional knowledge of what the memory *does* to the body, which in turn demonstrates and suggests emotionality of the memory and the personal importance of that memory to the individual.

The approach adopted here thus provides an opening for an alliance between the memory studies undertaken in geography and the biological sciences. In doing so, it is possible to see how the neurological networks of the body (re)act to an episode of reminiscence. This is especially interesting for research into nostalgia, since it encompasses both a sense of happiness and sadness; by using biosensing technology it is possible to infer which emotion dominated. For example, in *The mattering of memories'* the biosensing technology could identify that Terence experienced a great happiness when at his allotment, whereas Maria had a stronger sense of loss in regard to her childhood home even though they both (re)placed their previous homes to the present landscape. In sum, the embodied cognitive geographical approach to memory adopted here demonstrates how representations, evocations, and the processes of memory arise from an entanglement between world, body, and the neural.

8

NATURE-CULTURE & HERITAGE: EXPLORING LIVING HERITAGE SITES

This chapter discusses two types of living heritage features: historical parks (or post-*rus in urbe* estates) and ruins. As Chapter 5 showed, living heritage represents one of the few attempts in academic scholarship to understand residents' everyday connections to their heritage-rich neighbourhoods (cf. Baillie, 2013; Miura, 2005) aside from discussions on the implications of preservation laws and tourism (e.g. Jaafar et al., 2015; Nicholas et al., 2009; Rahman, 2012) but also considers heritage features that are still 'alive' – not fossilised or frozen in time (Lowenthal, 1998; Ramshaw, 2010; L. Smith & Akagawa, 2008). The post-*rus in urbe* [Latin: 'country in the city'] of Highbury Park is an example of a country estate within an urban setting. The estate, which included elaborate gardens and agricultural land, has now been converted into public parkland, but still has two significant traces of prior human-nature interactions: remains of agricultural and horticultural practices. Ruins (and the processes of ruination), on the other hand, represent an entanglement of nature and cultural processes where the cultural artefact (the building/structure) is being subject to natural processes (e.g. weathering, plant growth). As such, both these examples of living hertiage are understood to be a hybrid of cultural and natural heritage with the processes of each informing and influencing the other. In doing so, this chapter builds upon the arguments made in the two previous chapters on the physical/material environment and memory, demonstrating not only that the physicality of these spaces do not solely evoke the past but also contain a presence and new meanings. A landscape encompasses a host of intersecting histories; it is a spatialisation of meanings and temporalities which are "crossing, folding,

[and] piercing" rather than occurring in a linear and ordered fashion (Crang & Travlou, 2001, p. 161).

To unpick these "crossing, folding, [and] piercing" meanings and histories, this chapter moves beyond the use of questionnaires, which are common in heritage studies (see, for example, Chen & Chen, 2010a, 2010b; Nicholas et al., 2009; Zhao et al., 2016). In doing so the chapter responds to the recent call to consider the more-than-textual embodied approaches to heritage (Waterton & Watson, 2013, pp. 551–552): "what happens to our bodies within spaces of heritage, whether they are physical, discursive or affective?" And although a recent edited collection engaged with the embodied, sensory, and affective qualities of heritage landscapes (Tolia-Kelly et al., 2016), this chapter expands upon the work undertaken by affective scholars on heritage by incorporating "a means of capturing the embodied state beyond, but along with, discourse" (Waterton & Watson, 2013, p. 552). By combining the embodied state (through biosensing) and the rhetoric of individuals (through interviews) in a heritage-rich environment, this chapter also suggests a solution to Macdonald's (2013) issue with the analysis of embodiment and materiality in heritage studies. Macdonald argues that within research which looks at the affective capacities of heritage, the body is privileged at the expense of the narrative, and this "has the effect of separating 'the felt' from the linguistically expressed" (2013, p. 81). Thus, the biosocial approach adopted here discusses the dynamic interplays between 'the felt' and 'the expressed' emotional experiences of living heritage sites.

8.1 HIGHBURY PARK: CULTURAL LANDSCAPE OF PLURITEMPORALITY

Highbury Park, as a post-*rus in urbe* estate, demonstrates how past land use is significant in reading the present-day landscape and its features. Crucially, the past land-uses (namely agriculture and horticulture) and their consequential effects on the landscape demonstrate the fluid boundaries of natural and cultural heritage: the two are inseparable. Highbury Park,

therefore, can be considered an example of a cultural landscape, since human agency has shaped and reshaped the naturality of the space over time. The term 'cultural landscape' was coined by Carl Sauer, a cultural geographer, in 1925, and was argued to be "fashioned from a natural landscape by a cultural group" where "culture is the agent, the natural area is the medium, the cultural landscape the result" (Sauer, 2007 [1925], p. 46). It is important to note however that Sauer's work has been subject to numerous critiques (see Mathewson, 2009 for a review) especially during the 'New Cultural Geography' movement in the 1980s with critiques coming from mainly cultural Marxists (Cosgrove, 1983; Cosgrove & Jackson, 1987; D. Mitchell, 1995), but also humanists (Pred, 1983), (post-)structuralists (Demeritt, 1994), and feminists (G. Rose, 1993). Sauer's notion of cultural landscapes, however, is still used within heritage studies to discuss the merger of cultural and natural sites because the term, in UNESCO policy especially (see UNESCO, 2016, 2018), represents "a closely woven net of relationships, the essence of culture and people's identity ... they are a symbol of the growing recognition of the fundamental links between local communities and their heritage, humankind and its natural environment" (Rössler, 2006, p. 334).

Because cultural landscapes are formed and reformed by human agency, it has been argued that a cultural landscape is never finished (Ingold, 1993; Martins, 2016; Robertson & Richards, 2003). It has been shown how humans have shaped the landscape in the past (e.g. agricultural and horticultural legacies) but also continue to alter it (e.g. the work of volunteers and trustees). Considering this continued human-nature interaction in space, Highbury Park, which I introduce below, is in contrast with Sauer's notion of cultural landscapes, as he argued that: "under influence of a given culture, itself changing through time, the landscape undergoes development, passing through phases, and probably reaching ultimately the end of its cycle of development" (Sauer, 2007, p. 46).

The features discussed in this section demonstrate that the landscape is continuously subject to change: whether that is natural progression, such as the growth of vegetation or the levelling of the earth, or with different groups of people establishing their 'culture' onto the landscape. To consider both the historical traces and the contemporary actions in the landscape, this section focuses on a specific participant: Tony [Moseley resident, male, 55-65-years-old]. As well as being a Moseley resident, Tony is a volunteer at Highbury Park with an interest in living heritage. Even though two other participants did explore the park during their walks, Tony's account was richer because he was able to talk about the heritage

features in detail, had a personal connection to the park,[118] and had a psychophysiological reaction to them. Indeed, it has been shown in other work on heritage (that has used body-worn technology) that individual knowledge and expertise influences the psychophysiological and one's behavior in a space (Tatler et al., 2016).

The history of Highbury Park

Prior to the establishment of Highbury Park, the area was the Chamberlain family estate from approximately 1879 to 1914 (Highbury Park Friends, 2018). Joseph Chamberlain purchased a plot of land in the Moor Green area in 1879, where he built his Venetian Gothic mansion, which is now a Grade II Listed Building, with grounds landscaped by Edward Miller. The house was positioned at the top of the site so that it would not be overlooked from higher ground and could take advantage of the (then) rural views. By 1903, the estate extended over hundred acres, which included carefully designed and managed gardens and small-scale farmland in the north (The Highbury Estate), and open space (which was previously agricultural land) in the south (Henburys). Furthermore, a substantial acreage was leased to Richard Cadbury (the brother of George Cadbury), who built the new mansion of Uffculme.[119] The Uffculme Estate is now owned by the Birmingham and Solihull Mental Health NHS Trust and is separate from Highbury Park (Land Registry, 2018).

[118] As it was shown in the previous chapter, a personal connection with a space is more likely to evoke a psychophysiological reaction.

[119] The land register for the Uffculme Clinic (WM629873) declares that there was a lease "of [the] adjoining land … dated 10 January 1894 … made between (1) Richard Cadbury and (2) The Right Honourable Joseph Chamberlain" with the following covenants: the prohibition of the building of factories and the productions and selling of intoxicating drinks, and all buildings erected on the site must take up no more than a tenth of the land to allow for recreational space (Land Registry, 2018, p. 4).

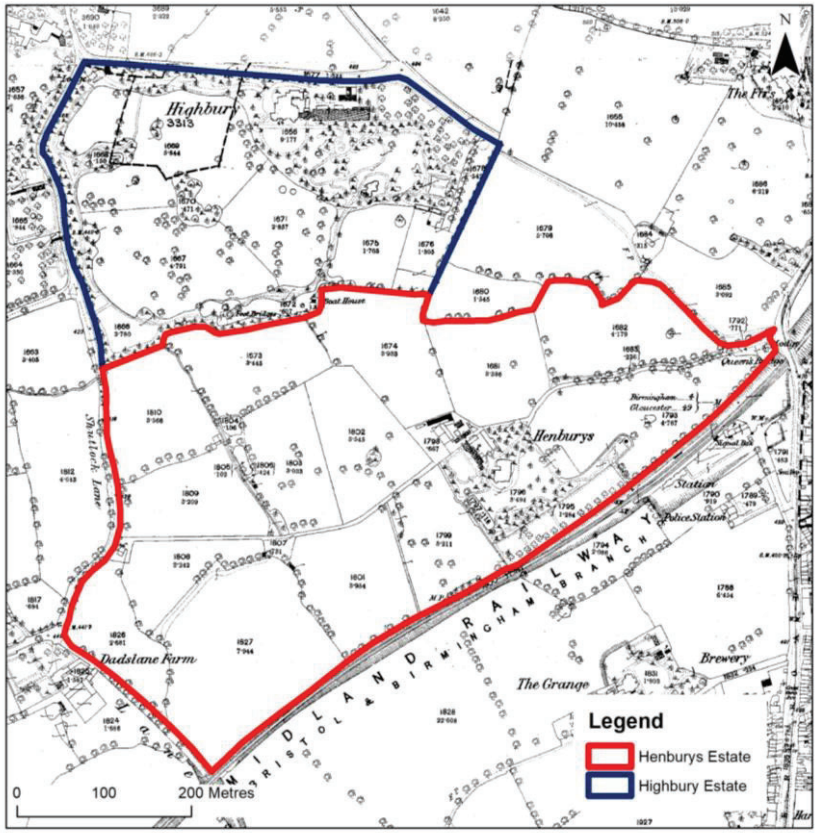


Figure 8.2: The outlines of the Henburys and Highbury estates (1884) (after Ballard, 2009).

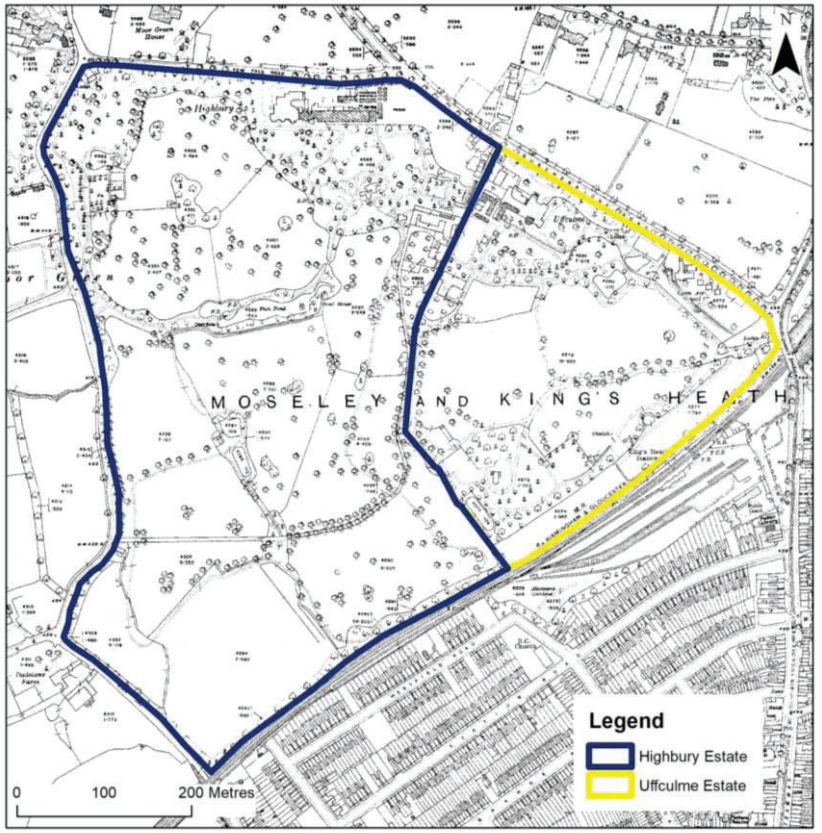


Figure 8.1: The outlines of the Highbury and Uffculme estates (1916) (after Ballard, 2009; Land Registry, 2018).

Whilst the boundaries of these three estates (Highbury, Uffculme, and Henburys) have changed over time, their legacy remains in the present-day Highbury Park (Figures 8.1 & 8.2 in comparison to Figure 8.3). The current ownership of the Highbury Park area can be divided into three entities: Highbury Hall Estate (leased by the Chamberlain Highbury Trust), old Henburys estate (owned by Birmingham City Council), and Uffculme (owned by institutions such as the NHS and state-funded schools). The latter is private land and is not officially part of the public park and will therefore only be briefly mentioned here since the participants were not permitted to enter that area of the park.

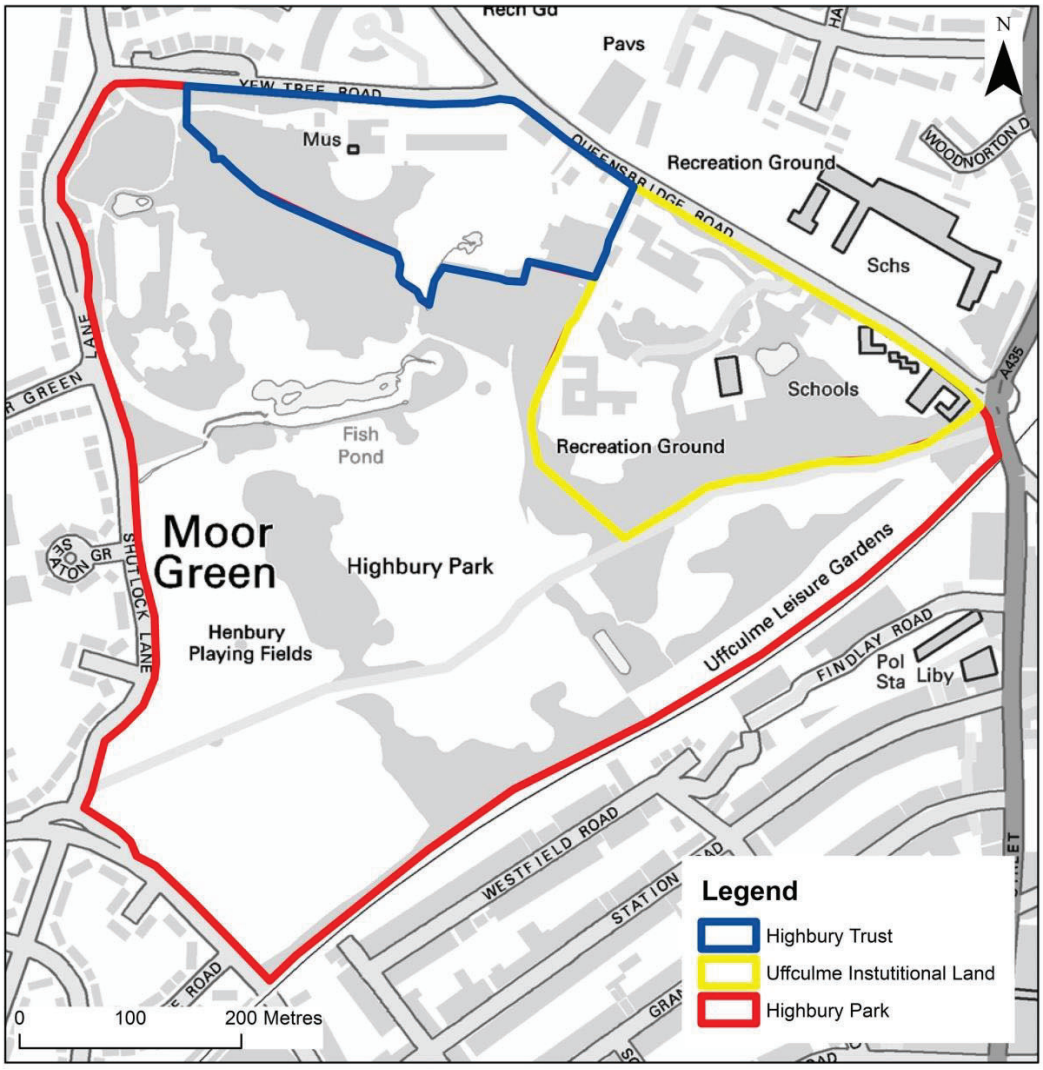


Figure 8.3: The boundaries of land ownership in the Highbury Park area (2018) (after Land Registry, 2018).

The combination of the old Highbury Hall Estate and the old Henbury Estate was included in the English Heritage Register of Parks and Gardens of Special Historical Interest in 1986 (Historic England, 2018), and demonstrates two types of historical human-nature interaction: agriculture and horticulture. The first, The Henburys, is a rare surviving example of an early 18th century estate, which were once plentiful in the now-suburban areas of Birmingham but have subsequently been built upon (Ballard, 2009; Whitehand & Morton, 2004). The gardens of the Highbury Estate are equally of historical significance; they were designed and implemented by Chamberlain and his landscaping team from 1879 to 1914. The gardens were renowned within the West Midlands at the turn of the 20th century and were widely written about in specialist gardening magazines (see, for example, Curtis, 1903, 1909; The Gardeners Chronicle, 1884, 1904). The traces of these historical interactions which are a pleasing quality of the park for visitors - Sonya [Moseley resident, female, 45-54-years-old], for example, commented upon how the ridge-and-furrow are a distinguishing feature of the park. For Tony the remnants of horticultural and agricultural activity in the park represent possibility and a dilemma:

> "The idea of heritage for me has to do with the landscape and the living landscape and how it is maintained. Here is some ridge and furrow and these can tell a story about a place, for these are just about the culture and heritage as grand houses. All of this space [south Highbury Park] is under control of the social services department but they were not interested in landscape. It was neglected and that is why we came in. There are still heritage features here that are animating the landscape as far as I am concerned" (interview with Tony, 29/11/2016).

Using Tony's account of the heritage features and the work he is doing to preserve these historical traces, the following discussion on cultural landscapes looks at the processes in place (or lack thereof) to protect these human-nature legacies and Tony's connection with the spaces based on his psychophysiological reactions.

Agricultural legacies in Highbury Park

Prior to 1840 there are few records of the landscaping of the Henburys Estate, however two Roman coins were found in the western Henburys meadows (Birmingham City Council, 2018a; Hodder, 2016) and there are traces from the Bronze Age in the two burnt mounds near the stream (Figure 8.4). Crucially, and relating to Tony's account of the park, there are

traces of medieval farming practices in the patches of ridge-and-furrow in the park. Ridge-and-furrow are a result of repeated non-reversible ploughing practice in the Middle Ages; the repeated movement of soil year after year built up in the centre (the "ridge") and leaving dips, or "furrows" between the ridges (Hooke, 1988; Palmer, 1996). Over the many hundreds of years, the ground has begun to level and produced a wavy surface on the current landscape:

> "This park happens to have half a dozen isolated areas of existing ridge and furrow. The whole area might have been ridge-and-furrow at one point but what is left are different bits here and there and the story as it goes is ridge and furrow are cut at different widths depending on the kind of machinery that was used. Older machinery made much wider furrows than modern equipment. […] It might not be as glamourous as a big building but there is still a story that somebody was doing that - you know somebody had an ox-drawn plough. So, for me that's the narrative of the place and it's nice for me to come here and connect with that and wonder what people then would have done" (interview with Tony, 29/11/16).

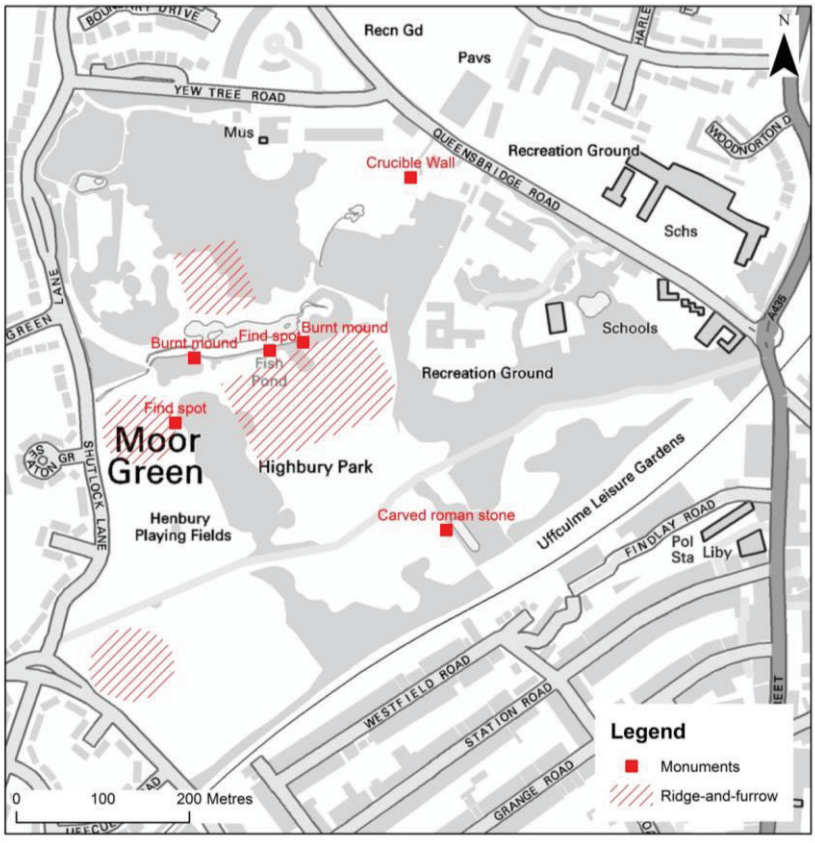


Figure 8.4: Historical sites in Highbury Park (after Birmingham City Council, 2018a).

The ridge-and-furrow is a prime example of historical interaction between humankind and nature, whereby humankind altered the environment and nature over time has eroded the alteration into a wavy surface (and continues to do so). As such, the preservation of ridge-and-furrow is difficult because intervention will interrupt the hundreds of years it took to create the distinctive landscape feature, or as Tony argues:

> "How we manage it [ridge-and-furrow]? Are we happy to just let it go and disappear? Do you just leave and say that is authentic and it's just a trace or do you come back in a plough it again with reconstructed equipment from the same era? Do you do a reconstruction somewhere else? With a big house you can pretty much preserve it as is but the landscape requires constant intervention to preserve and maintain. That is why I like it because you have that chance to fit in with those 100 years of practice to keep it going" (interview with Tony, 29/11/16).

Since the land where the majority of the ridge-and-furrow is situated is owned by BCC, minimal procedures are in place to protect the landscape feature. The land is tended to by the park keepers who mow the open stretches and maintain the trees and shrubbery. It is the volunteers in the park, however, who are attempting to preserve the landscape through education. For example, a volunteer group called Highbury Park Friends have designed a discovery trail of the park (Highbury Park Friends, 2012) and ran workshops educating the local population on the varieties of ridge-and-furrow in the park.

The ridge-and-furrow is a significant feature of the park and was observed by all of the participants that walked through. It is one of the features that contributes to the park's geomorphology, where the rangers and the volunteers are working to return some areas of the park back to how it was in the 19th century and educating visitors as to why. For Tony, therefore, these features are a source of pride and excitement. Indeed, in Figure 8.6 there was a small stretch of mid-level EDA recordings (orange) which coincides with increased fluctuation in BVP, which would imply amusement.[120] However, it was not just the ridge-and-furrow, as an agricultural legacy, that stirred a psychophysiological reaction from Tony.

[120] Amusement here is understood to be positively entertained by a space, rather than finding something humourous.

In addition to the patches of ridge-and-furrow in the park, there are also traces of the old agricultural field boundaries and ha-has.[121] The Moseley Yield of the King's Norton Tithe Map of 1840 and the Apportionment of 1844 give detailed information on the composition and layout of the Henburys (Figure 8.5). The land usage over time has been thoroughly discussed by Phillada Ballard (1986, 2009) and therefore the focus here is the legacy of this human-nature interaction in the physical environment as opposed to the landscape morphology.

Unlike the ridge-and-furrow, these traces of human-nature interactions are not an overly popular feature of the park, yet they are still of interest to Tony:

> "There were lots of parcels prior to 1840 and there's a tithe map that shows all the field boundaries. I am pretty sure that oak, that oak and a further oak were field boundaries. I have talked about it with one of the park rangers and he is pretty sure it is a field boundary because the oak trees are old enough to be young when there was a hedgerow here. So he thinks there wasn't just a field boundary but a hedgerow. So when I was walking there I was thinking that I am walking the old field and I can try and imagine what this was like 200 years ago. And it's important because this particular landscape has been in this condition for a lot longer than 200 years. It's open land, it was farmland, it was made this way by people. That's the living heritage as far as I'm concerned" (interview with Tony, 29/11/16).

Not only did these agricultural traces (Figure 8.5) evoke imagination from Tony, but there was also a minor increases in his EDA while he was walking along the old field boundaries (Figure 8.6) which may imply that he was amused (cf. Kreibig, 2010). Indeed, Tony even specified that he thought that being among the tree line would be emotional for him:

> "There are other bits of traces of [farming] around here that I think are quite evocative. The trees are evocative and I think me reading the landscape in this way will give me an emotive response; it will be interesting to see how that shows up" (interview with Tony, 29/11/16).

[121] A ha-ha is a designed recess in the landscape that prevents grazing livestock access to a space but does not interrupt the view with a wall or fence.

The relationship between memory and imagination that Philo (2003) discusses in relation to children's geography could be applied to Tony's experience of the agricultural traces. Philo (2003) applies Bachelard's notion of the reverie to memories of childhood. The reverie is a conscious dreamlike state where the processes of imagination allow the individual to 'drift' into those remembered spaces and events (such like Terence's account of the allotment in the previous chapter). It is a moment when imagination and memory work in unison which reanimate the past in the present. Tony's reaction to the landscape, however, is an imagination of the past and not directly linked to memory, unlike his experiences of the old Highbury Estate.

Figure 8.5: The 1840 field boundaries on a satellite image of Highbury Park (after the Moseley Yield of Kings Norton Tithe Map of 1840 and the Apportionment of 1844).

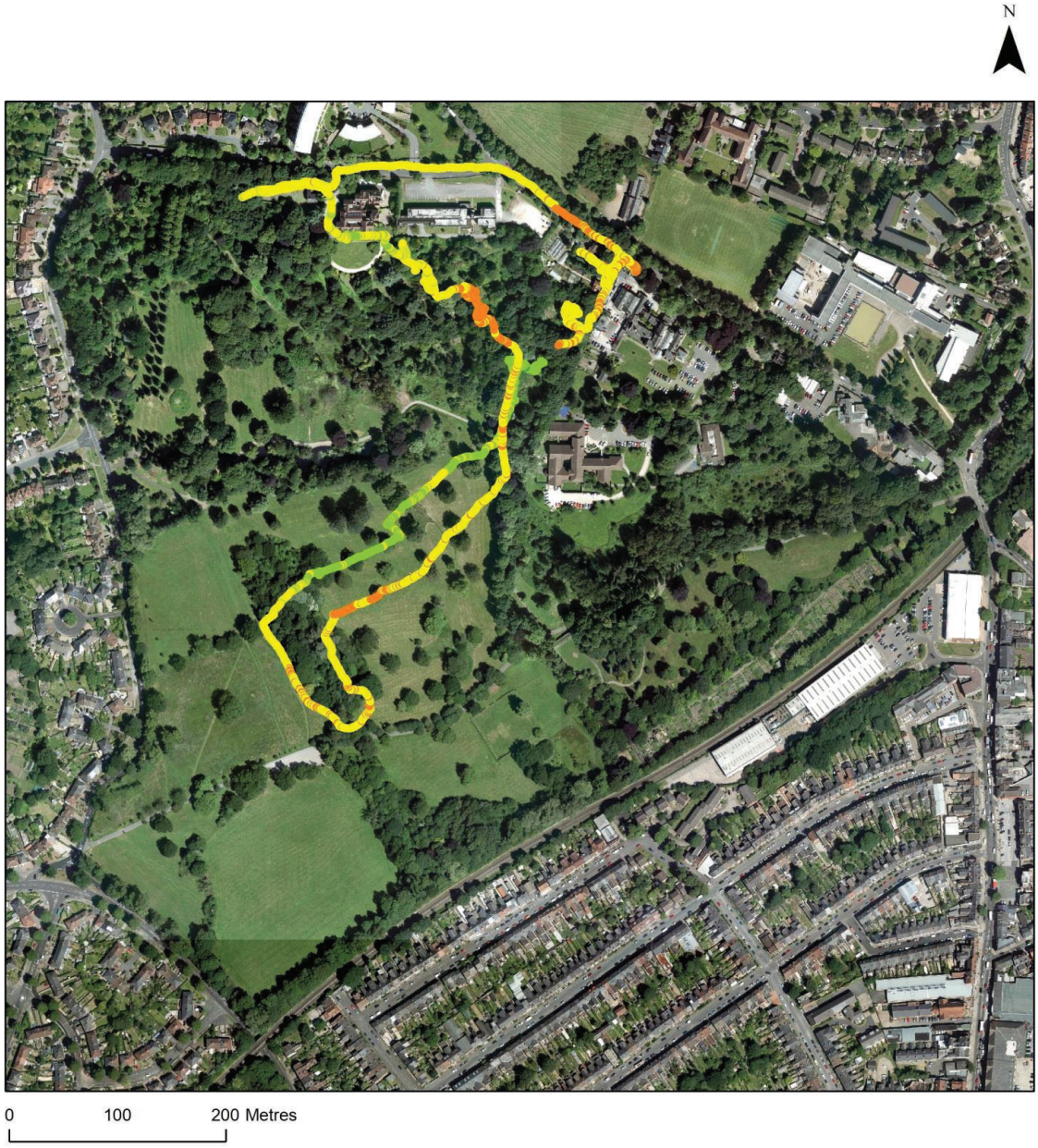


Figure 8.6: Tony's EDA bio-map on a satellite image of Highbury Park – note the fluctuations between medium and high EDA recordings when he was walking along the old field boundary (the most southwestern aspect of the walk) and when he was looking upon the ridge-and-furrow (the larger stretch of high EDA – orange – in the southern part of the walk).

Horticultural legacies of the Highbury Estate

During his residency at the Highbury Estate between 1878-1914, Joseph Chamberlain (with the help of landscape designer Edward Milner) maintained and tended to an elaborate garden spanning around 25 acres (Ballard, 2009; History West Midlands, 2018). By 1914 there were a variety of gardens with different themes (including Elizabethan, Dutch, and Italian), pools, and carefully designed paths around the estate. After Chamberlain's death, however, the majority of the gardens were left unmanaged leaving certain plants to dominate the area (such as laurel, Japanese knotweed, and rhododendron). The gardens in the immediate vicinity of Highbury Hall have been tended to but this is mainly due to Highbury Hall's predominant use as a civic wedding venue (Elkes, 2018). The rest of Chamberlain's gardens, however, are now overgrown (Figure 8.7).

Figure 8.7: Video still from Tony's walk demonstrating the dominance and overgrown nature of the laurel in the park.

Tony and other volunteers and trustees, however, have begun to clear, manage, and reinvigorate the overgrown garden areas back to their former glory (History West Midlands, 2018; The Chamberlain Highbury Trust, 2018). Not only have the volunteers begun to re-establish the orchard (i.e. Highbury Community Orchard) but have cleared and restored the

viewing platform north of the small pool in the eastern area of the Highbury Estate. The restored viewing platform is a source of uneasy pride for Tony, who helped to clear the area:

> "I've opened this area up and there is a certain association I have with that and revealing what this is. […] I have mixed feelings because on the one hand what we've done is made the place more accessible, we have revealed some hidden history, we've made it safe for people coming here and people do come here and use it repeatedly. So, we've won in that we have made it into a public amenity that people will use. So, there is a public agenda that that satisfies which is a good thing. But I have lost that sense of dark awkward tangle of jungle that has a lot of character. So, we have lost a certain type of character here but gained a public benefit" (interview with Tony, 29/11/16).

Looking at Figure 8.8, there is a clear emotional reaction that occurred when Tony was walking through the newly cleared land. The increase in EDA coinciding with a decline in TEMP would suggest that Tony had a negative emotional response to this area (Kreibig, 2010): either anxiety or anger. Indeed, the quote eloquently demonstrates Tony's conflict and anxiety over clearing the space.

Figure 8.8: Tony's EDA Map – there are three areas of interest in this map: (1) The stretch of mid-level EDA (yellow) and the small patches of moderate EDA (orange) which coincides with when Tony was looking at the ridge-and-furrow. (2) The fluctuating stretch of mid-level and moderate EDA where Tony was walking along the old field boundary. (3) The large wavy stretch of moderate EDA (orange) towards the north of map where Tony was walking through the recently cleared land near the reviewing platform. These three areas represent Tony's different emotional reactions to the heritage of the park: amusement for 1 and 2, and anxiety for 3 (with the HR, BVP, and TEMP considered).

Just like the agricultural legacies, this area was another example of human-nature interaction where human action (Joseph Chamberlain's planting of (invasive and) foreign plants) has shaped and reshaped the natural qualities of the space. This is then complicated by recent human action, which resulted in a cleared space available for human use, but also increased biodiversity in the area. As such, the viewing platform area could be argued to be an example of conversion that is linked to ecological benefits (cf. Lowenthal, 2005). Yet since there was significant human involvement in the area to begin with, perhaps this area could be a demonstration of human action to rectify human action. Regardless, the processes that took place at the viewing platform area clearly demonstrate the fluid nature of heritage between culture and nature; nature is ultimately impacted by human agency, and human action is influenced by environmental impress - not all heritage fits in with the culture/nature binary.

Furthermore, the environmental changes in naturally rich heritage sites (such as the overgrown nature of Highbury Estate gardens) can lead to a change in what the sites are remembered and preserved for. For instance, between the Uffculme Institutions and Highbury Trust lands is a crucible wall built by Joseph Chamberlain (Figure 8.9). The wall, which is built from crucibles filled with slag,[122] is about 20ft high but there is no record of why it was built. As such, visitors to the site have come up with their own narratives (cf. *"The Mattering of Memories"* in Chapter 6):

> "[The wall] has made its own mythology. People say that these are cannon shuttles, and others say this was built as a spite wall between Joe Chamberlain and Richard Cadbury and so on. So, people will make their own stories and explanations about it. There was a group of guys that came along to do some community work and one of them was really taken back by this wall and he wanted the others to see it so we came up here and I gave them the story of it. He asked me why people call it the 'angry wall' – whether that is because it was built by Joe Chamberlain to spite the neighbours or because some people think it's where you go when you are angry" (interview with Tony, 29/11/16).

[122] These slag-filled crucibles are likely to be scrap from Joseph Chamberlain's screw manufacturing business.

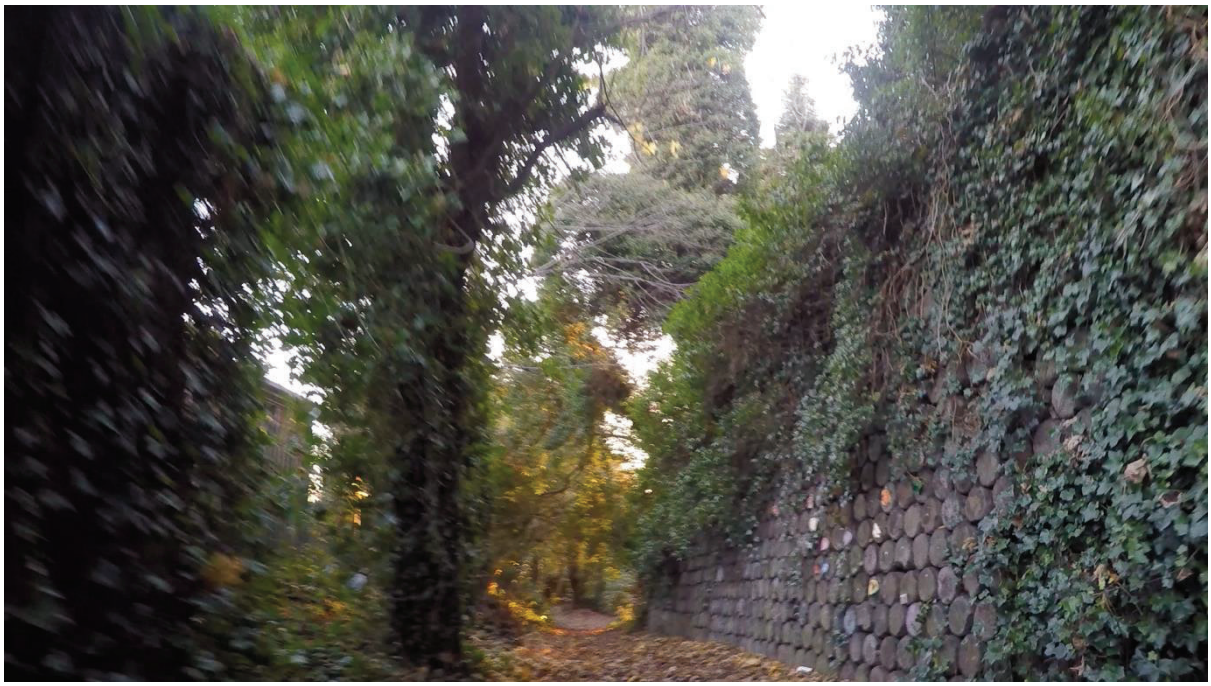


Figure 8.9: Video still from Tony's walk: The 'Angry Wall'

Figure 8.10: Video still from Tony's walk: The Peace Garden

Also, on the other side of the wall from Figure 8.9, in the post-Elizabethan Garden is a Peace Garden to commemorate those who have died there. Because of the overgrown nature of the garden, the space was "used quite a bit by drinkers, rough sleepers, cruisers, and people like that" (interview with Tony, 29/11/16). Before the area was cleared, people who had died from substance abuse were found there, and since the area has been cleared there is a tree to commemorate those who has died there. For example, there is a lone tree in garden (Figure 8.10); many trinkets dangle from it to represent each individual. This memorial, which would be considered a cultural historical feature, has only arisen due to the previously overgrown nature of the land. If it was not for nature's reclamation of the area, these people would not have had the space of solitude needed for their recreational substance abuse, and the memorial would be non-existent.

Crucially, the Angry Wall and the Peace Garden reiterate a point that was made in the previous chapter: that memories and narratives can be (re)ascribed to space (cf. "*The Mattering of Memory*"). Both the Angry Wall and the Peace Garden had a history but through people's interactions with that heritage their meaning has changed. Furthermore, the Peace Garden demonstrates how cultural heritage is not without natural impress – without the natural influence on the area, the memorial would have not been established. Furthermore, the Angry Wall and the Peace Garden demonstrate how heritage spaces are not solely the preserve of those who understand and enthuse over (such as Tony), but rather have a multiplicity of uses within the resident population (cf. Miura, 2005). Thus, this area epitomises a living heritage site because it shows how heritage transforms over time but is enriched by the living population living in and around the site.

8.2 DERELICTION & RUINS: THE CLASH OF NATURE AND CULTURE

The term 'ruin' can be interpreted in a variety of ways and can refer to both object and process (DeSilvey & Edensor, 2012; Hell & Schönle, 2010): 'a ruin' (noun) and 'to ruin' (verb). Furthermore, there is a distinction between the temporality of ruins - what Lucas (2013) terms 'fast' ruins and 'slow' ruins. The fast ruins are created after being subject to

an abrupt transition, such as a natural disaster or war damage. The latter, however, develop gradually over time as a result of socio-economic changes and the building/structure's abandonment. Since the majority of buildings are preserved in the three conservation areas, and there has not been any recent war damage or natural disasters, the focus in this section are structures that are in the process of slow ruination; where the agencies of dereliction and material decay are dominant.

Unlike classical ruins,[123] which exhibit graceful decay, the examples discussed here (i.e. 'modern ruins') have been described to be like "a fresh carcass spilling out its guts, where intentional human abandonment or destruction is often as prevalent as nature reclaiming its own" (Lucas, 2013, p. 194). This is not to say that modern ruins are without aesthetic appeal; Tim Edensor's work has demonstrated how derelict factories and other industrial ruins have rich and complex aesthetic and atmospheric qualities (ibid., 2005a, 2005b, 2007, 2018). Furthermore, the study of modern ruins is better suited to explore the connections between time, space, (im)materialities, perception, and, crucially, the blurring of nature and culture since it is possible to see the agencies in process. Unlike the previous discussion on natural/cultural heritage in Highbury Park, however, this discussion on ruins focuses on the various different psychophysiological reactions and consolidates upon the previous discussions in this thesis (e.g. nature-culture (this chapter), sensory perception (chapter 6), the uncanny (chapter 5), and nostalgia (Chapters 7)) to explore these differential experiences.

Ruins as nature-culture in process

Ruins, or more specifically structures under the process of ruination, blur the boundaries between nature and culture. For Simmel, in his paper 'The Ruin' (1958 [1911]), ruins represent a balanced tension between nature and spirit.[124] Simmel saw this tension as a reversal; nature is recovering what human spirit had created by transforming a product of humanity into something new. Ruination, or what Simmel terms 'nature's revenge', is seen as nature overcoming spirit's control and folding-back the structure onto itself. Thus,

[123] Classical ruins, such as the Roman Forum in Rome, are ruins were the processes of decay have pretty much slowed to a halt (Lucas, 2013).

[124] Simmel's use of the term 'spirit' is not referring to a Holy Spirit or an immortal soul, but typically understood as 'the human spirit' (M. Davis, 1997; Hancock & Garner, 2014).

ruination can be seen to epitomise the "world-pervading original enmity" (Simmel, 1958, p. 380) between nature and culture.

Simmel's categorisation of ruins, however, is not without issue, and it would exclude many examples of human-influenced ruins, such as the atomic fallout in Hiroshima and Nagasaki in 1945, the World Trade Centre in 2001, and the 'Pompeii of the North'.[125] For Hiroshima, Nagasaki, and the World Trade Centre there was minimal nature involved in their ruination, and it was through human intervention that the 'Pompeii of the North' became a tangible ruin (through excavation). In all of these examples, their status' as ruins where only possible through human agency, not exclusively the "crumbling power of nature" (Simmel, 1958, p. 381). This is not to disprove Simmel's characterisation entirely; once these sites are exposed and left, they decay naturally and undergo a double ruination. But if we follow Latour's (1993) suggestion of hybrid agencies, then Simmel's characterisation loses relevance; the formation of ruins is not due to natural *or* cultural/human agencies, but natural *and* cultural/human agencies.

Within the Jewellery Quarter, for example, there are many examples of dereliction and ruination where thirty plots of land (3.81% of buildings) were listed as either dilapidated or derelict with a further seventy-three plots (9.28%) vacant and starting to fall into disrepair (Blackswan, 2013, p. 20 - Figure 8.11). Furthermore, the two cemeteries have fallen into minor disrepair with the inevitable processes of decay that come with time and a lack of thorough care.[126] The majority of the Jewellery Quarter residents (70%) observed and commented upon these spaces of dereliction and ruination, such as Owen [Jewellery Quarter Resident, Male, 25-34-years-old]:

> "This is really a shame because they are just letting the old building there deteriorate. It would be nice if someone came in and restored it to what it was rather than just leaving it there for the plants to get into the brick work and fall apart. You do on occasion see folk come and inspect it now and

[125] 'Pompeii of the North' refers to the town of Heimaey, Iceland, which was buried under lava and pumice following a volcanic eruption in 1973. The town has been excavated for a museum that opened recently (McMahon, 2014).

[126] The cemeteries are now cared for m volunteers who are trying to restore them back to their original glory, namely the Friends of Key Hill & Warstone Cemetery.

> again or see some staffolding up when they are doing something but mostly it is just left to the elements. Maybe there is just no money in it … I never really noticed how many buildings there were like this around the Jewellery Quarter" (interview with Owen, 20/08/16).

As Owen's quote demonstrates, the old industrial ruins are a blurring of natural and cultural forces. In a ruined space the roof(s) and walls are open leaving the interior open to the elements. This leaves the structure vulnerable to protruding plants and mobile non-human life forms (such as rats, foxes, and badgers) that are usually present in exterior and marginal spaces (DeSilvey & Edensor, 2012).

Figure 8.11: Property utilisation in the Jewellery Quarter (after Blackswan, 2013, pp. 20–21).

Owen's account of the ruined structure indicates that are there also human agencies at play in the site in a likely attempt to maintain the integrity of the structure. Indeed, Karen, who works as a property developer in the Jewellery Quarter, explained:

> "There's lots of buildings in the Jewellery Quarter that are owned by people who don't live here and the ones that haven't been pulled down are protected … The people that own those protected buildings have to look after them because they are protected, but they haven't got the money to renovate them … and follow the conservation laws. So they do the bare minimum to keep them standing until there is value in working with them" (interview with Karen, 17/08/18).

For example, Karen on her walk pointed out one particular building that she admired but was angry that minimal work was being done on a small two-floor factory building on Mary Street (Figures 8.12 & 8.13). She explained that the building's listed status means that any renovations have to ensure that the lower floor is used for crafting or light industry and that is why she thought it would be difficult to sell.

Yet, the participant's interest in the derelict space means that the structure(s) must have aesthetic qualities that inspires hope, interest, or appeal that can be beyond financial gains. Indeed, Edensor's work on ruins (2005a, 2005b, 2007, 2008) has demonstrated that these structures have a wealth of multi-sensory effects that enliven the body. The biosocial approach, especially with the use of biosensing technology, allows this study to measure this enlivening of the body and uncover new understandings and interpretations of the body and its psychophysiology. This is because being in a risky, unfamiliar, and uncanny space develops a more attuned body that directs more attention to the sensory qualities of that space.

Figure 8.12: Video still from Karen's walk - disused factory building on Mary Street.

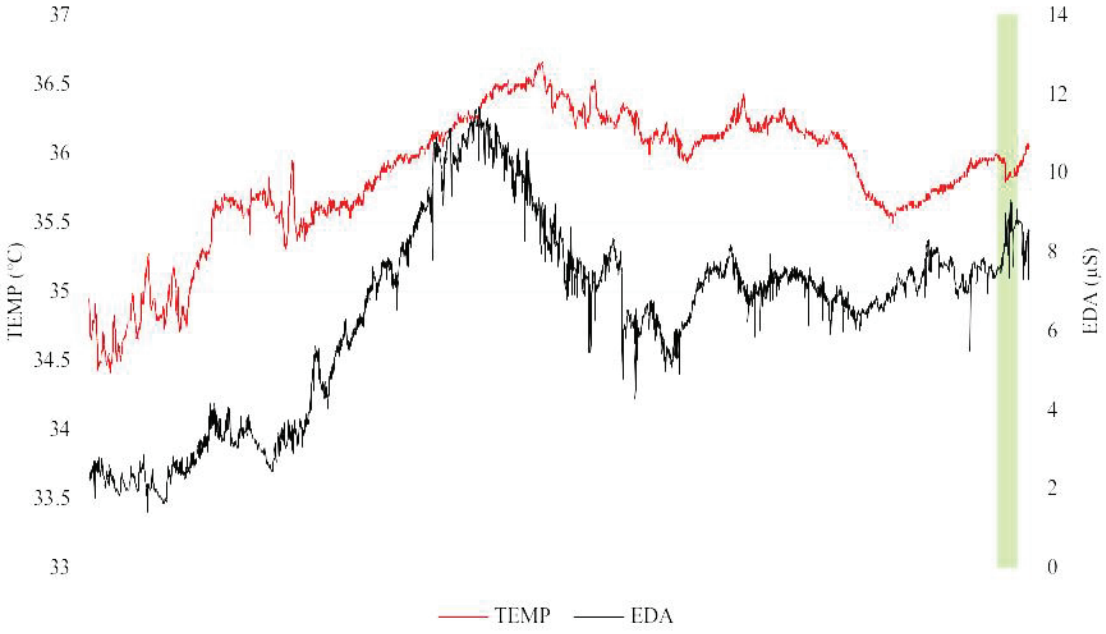


Figure 8.13: Karen's EDA and TEMP biodata – the highlighted area coincides with when Karen was looking at the old factory building on Mary Street. The sudden dip in TEMP and rise in EDA would indicate that Karen was either feeling anger or disgust.

Sensing ruins

As Chapter 5 demonstrated, a sensuous engagement with the world is one of the ways people make sense of their surroundings. This sensuous engagement with space is dependent on the material qualities of spaces; the textures, contours, atmospheres, temperatures, and gradients that encourage particular actions and feelings:

> "the sensory is not only encapsulated within the body as an internal capacity or power but is also dispersed out there on the surface of things as the latter's autonomous characteristics, which can then invade the body as perceptual experience" (N. Seremetakis, 1994, p. 6).

Thus, sensuous experience arises from a "polyphony of the senses" (Bachelard, 1971, p. 6) that informs the individual about their surroundings. As the body senses space through movement, it too is touched and there is a coupling of motion with emotion – it becomes "a sensuous space of emotion" (Bruno, 2002, p. 203). The entanglement of emotion and sensuous experience with the body is habitual in that the individual grows accustomed to the sensory experiences that are common in their everyday life (Lippard, 1997) such as the traffic outside their home. Even the spaces of the city are highly regulated; the materialities and sensualities are organised to cajole bodies into particular practices and performances in the spaces (cf. "blandscapes" - Drobnick, 2002). And this is precisely why encountering a ruin is such a distinct sensuous experience; it does not harmonise with the typical sensual experience of the city:

> "in the ruin, the dissolution of sensual familiarity and the advent of sensual surprises may be initially overwhelming, repulsive or arresting, but it also has the potential to provide a stimulating experience by this distinction from the familiar" (Edensor, 2007, p. 226).

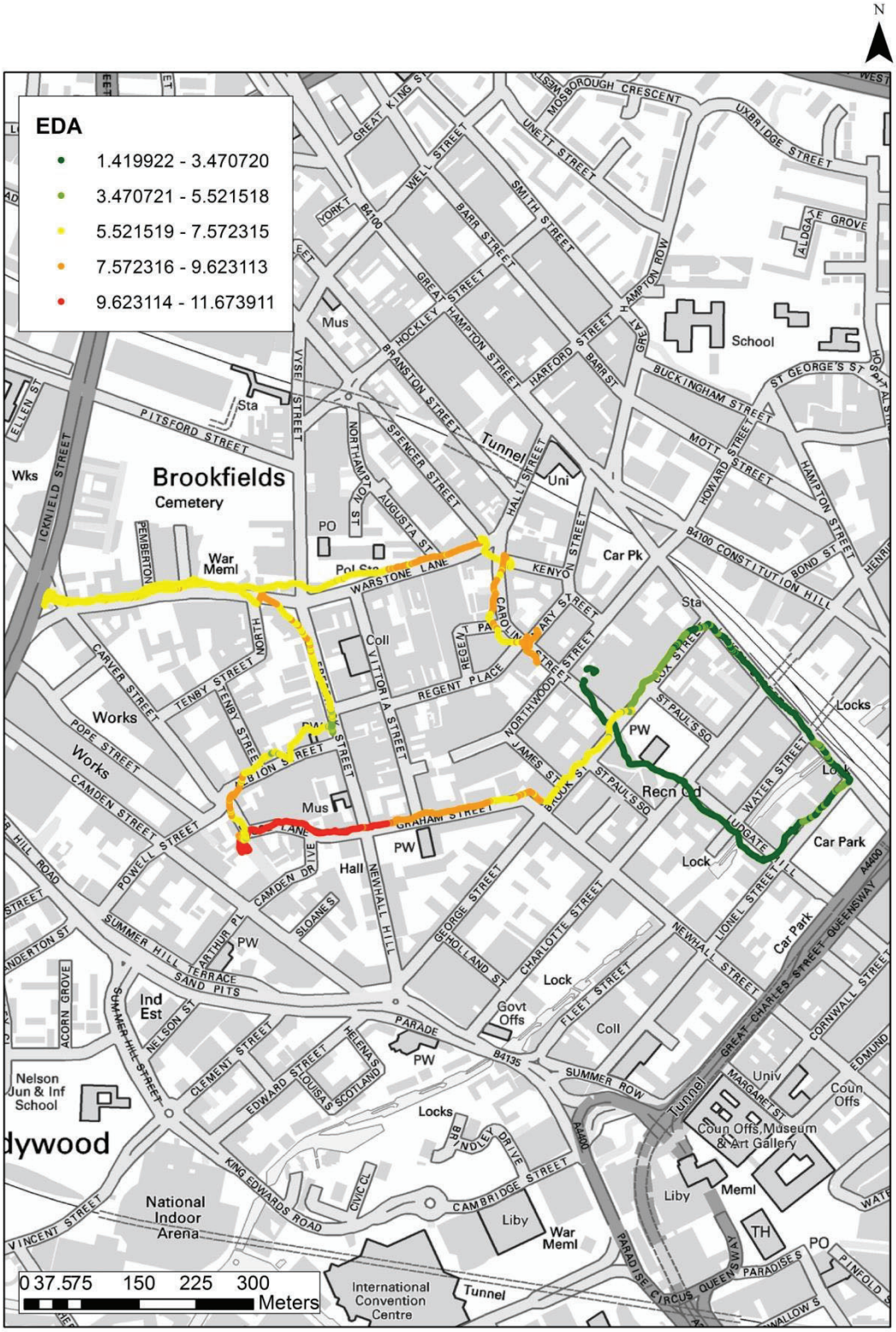


Figure 8.14: Karen's EDA biomap - note the area of high EDA (red) along Graham Street and Legge Lane when Karen was walking by a row of derelict and ruined buildings.

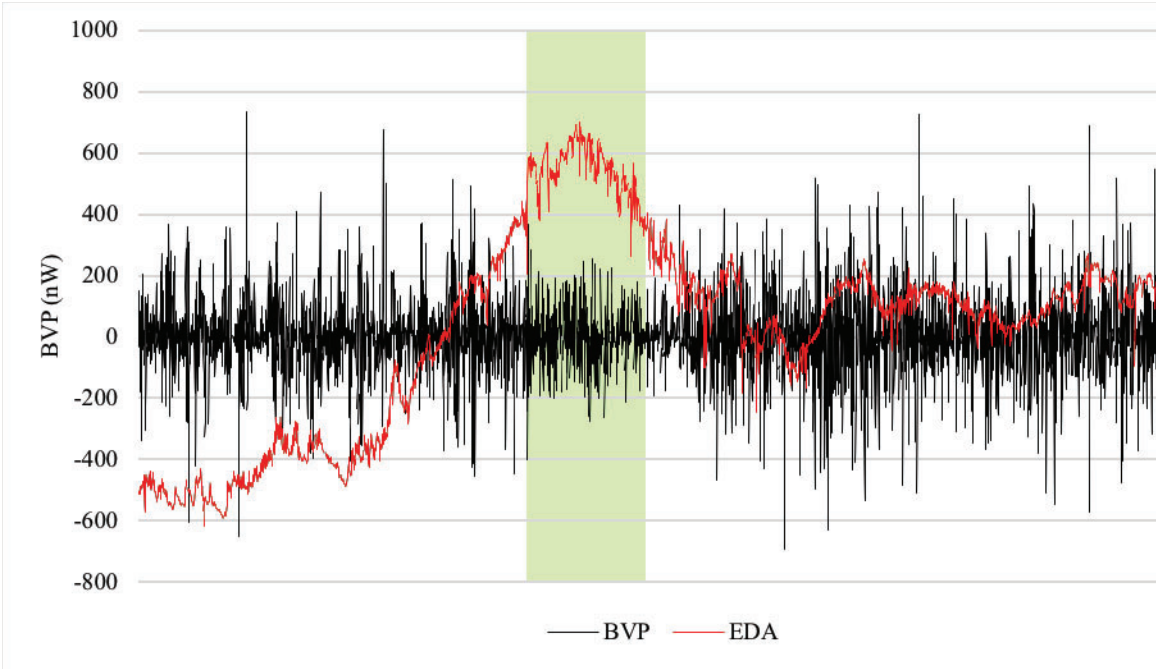


Figure 8.15: Karen's EDA and BVP biodata - the highlighted area shows an increased level of EDA with minimal fluctuation in BVP. Combined, these two measures indicate that Karen was feeling anxious (Kreibig, 2010).

Figure 8.16: Video still from Karen's walk - dereliction and ruination along Legge Lane.

One key sensual surprise is the soundscapes of ruined spaces - especially the juxtaposition of a lively city compared to the eerie silence of a ruined space. It was shown in Chapter 5 how the soundscape can stir a psychophysiological reaction in the body. But unlike Michelle's space of solitude in Moseley Park , the quietness of Legge Lane was not a source of comfort for Karen; instead it caused her EDA levels to rise and BVP to remain fairly steady indicating an anxious state (Figures 8.14, 8.15 & 8.16). This may be because in an urban environment one expects a variety of sounds which "consolidates a sense of being in place and accompanies habitual routine" (Edensor, 2007, p. 225), but when Karen entered this diminished soundscape the routine is broken and there is a disjuncture between the urban landscape that she is seeing and hearing:

> "You just don't know and you don't know what the risk is. I wasn't very comfortable walking up there today, it was too quiet. Those buildings are beautiful but also are scary. They are all boarded up and have plants growing out of them" (interview with Karen, 18/08/2016).

Karen's account and psychophysiological response demonstrates how the body encountering ruins is animated by the abundance of unexpected sensory stimuli which are hard to ignore or disregard (cf. Edensor, 2005a, 2007). Karen's account also demonstrates the gendered nature of scholarship on derelict spaces which are often autoethnographic accounts of men exploring unregulated space (e.g. Edensor, 2005a; Garrett, 2011a, 2012) with much less fear compared to women where these "dark, derelict urban environs signal the dangers of sexual harassment or assault" (Mott & Roberts, 2014, p. 236). Thus, this embodied response is an acknowledgement of the hazardous nature of the unknown and the unfamiliar where the more sensually attuned body is compelled to negotiate the risky ruined spaces. Edensor (2008) likens this embodied reaction to Deleuze and Guattari's (1987) 'becoming animal' and the body's physical and sensual adaption to its surroundings when it has been in a natural environment for a period of time (such a long distance walk in Scotland). Thus, for Karen, the unusual soundscape evoked an anxious state, which is an anticipatory state. Indeed, anxiety has been defined as "a future-orientated mood state in which one is not ready or prepared to attempt to cope with upcoming negative events" (Barlow, 2000, p. 1249). As such, Karen's psychophysiological response to the ruined spaces of Legge Lane eloquently supports and elaborates upon Edensor's understanding of the body among ruins.

Aside from the sensory qualities of the ruins, these spaces have alternative sensory qualities which are unique among the homogeneity of (most) urban design. This alternative aesthetic, however, is not necessary one of disgust, and encountering a ruin allows for heterodox appreciations of beauty and form (Edensor, 2018). Unexpected or incongruous sights, such as the plants in Rebecca's quote [Jewellery Quarter resident, female, 25-34-years-old], can stir a reaction in the body (Figure 8.17):

> "Some of [the buildings] are really, really beautiful. There's one just here, just in and it's a really old red brick building and really high and it has beautiful detailing [and] there are plants growing out the top of it. It's beautiful; I just wish someone would take care of it. But the derelictness is kind of nice too. You know, not in a morbid way, but it makes it different to the rest of the buildings" (interview with Rebecca, 18/08/2016).

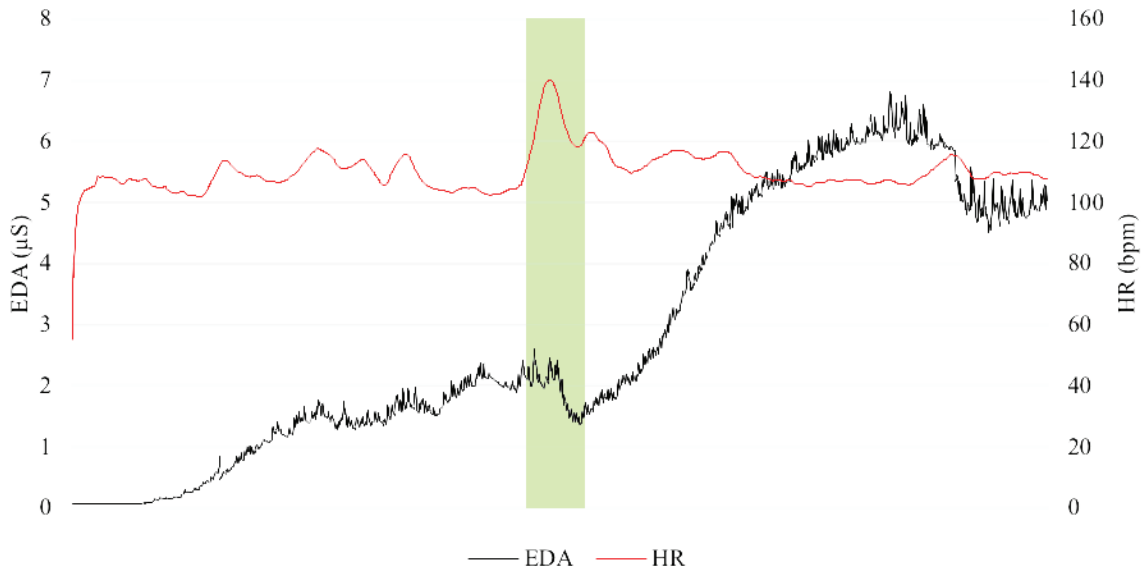


Figure 8.17: Rebecca's HR and EDA biodata – the highlighted area shows a considerable increase in HR and a minor increase in EDA which coincides with when Rebecca see the old derelict red brick building. This sharp increase in these measures would infer a short burst of disgust which was followed by a state of relief.

These unexpected or incongruous qualities of a ruin can (physically) jolt the body out of the everyday and (often) mundane processes of walking.[127] Because of the encounter with the derelict red brick building Rebecca experienced a short burst of surprise (shown by the peak in HR) which is followed by a period of relief (shown by the sharp decline in EDA and HR). Rebecca's biodata and account of her encounter with the red brick shows an initial shock of the oddities of the ruined space and the body's heightened perception which is attuned to sensual orderliness. The ruin, therefore, fosters "a way of looking and experiencing the world in which the eye does not act to hold external objects in a firm contemplative gaze … it is a way of looking that feels its way around that place with a distancing look … [it is] intensely tied up with the other sensations of the body" (Latham, 1999, p. 463). Gazing upon a ruin, therefore, is particularly multi-sensual; inextricably embedded in the multi-sensual nature of the body which is heightened in these spaces.

Ruins as an uncanny

From Rebecca and Karen's encounters with ruins, it has been shown that ruins have the capacity to evoke a variety of sensory experiences as a result of the unusual affordances of the site. This is because derelict or ruined buildings not only blur nature/culture and past/present but also the familiar and unfamiliar. As such, perceiving ruins can be considered in relation to the Freudian notion of the uncanny. The uncanny, which derives from the term *unheimlich* [German: 'unhomely'], typically lives in a space of fantasy and introspection (S. Freud, 2003b; Haughton, 2003; Howe, 2010). Simply, Freud's theory of the uncanny refers to both an object of aesthetics which is situated between the real and the fantastic and the consequential emotion of witnessing such a phenomenon. Although Freud did not overly concern himself with the non-human, the theory of the uncanny can be applied to ruination because the uncanny is not necessarily a material entity, but an unpleasant feeling that arises from encountering something new that is also familiar. As such, the uncanny is the "experience of liminality" that stirs "feelings of uncertainty, in particular regarding the reality of who one is and what is being experienced" (Royle, 2003, pp. 1 & 2). Thus, it has been used by a range of scholars looking to investigate the co-mingling of opposites and the

[127] This can also be related to Lefebvre's discussion of moments where the body can be jolted out of everyday mundanity into (utopian) moments of potential transcendence and clarity (see Gardiner, 2004).

dissolution of borders making it an enormously elastic concept.[128] Vidler (1994, p. 12), for example, in his discussion of uncanny architecture argues that it is possible to interpret spaces and buildings using the theory:

> "If there is a premise to be derived from the study of the uncanny in modern culture, it is there is no such thing as an uncanny architecture, but simply architecture that, from time to time and for different purposes, is invested with uncanny qualities".

With this in mind, the neglected cemeteries in the Jewellery Quarter are prime examples of uncanny spaces. These cemeteries are where "the terrain of the living meets the terrain of the dead" (D. S. Miller & Rivera, 2006, p. 348); a shadow site that is simultaneously apart from and a part of the city (cf. Legacey, 2016). Indeed, as Freud notes, the uncanny is most powerfully experienced "in relation to death and dead bodies, to the return of the dead, and to spirits and ghosts" (S. Freud, 2003b, p. 241). Key Hill Cemetery, which is one of the oldest cemeteries in Birmingham, was identified as the 'spookier' of the two cemeteries by Christina [Jewellery Quarter worker, Female, 35-44-years-old] and Amanda [Jewellery Quarter resident, Female, 55-64-years-old]:

> "It's very dark. That's the one that has had the most problems with drugs. It's quite eerie, it's got a really eerie feeling about it. Not a nasty eerie feeling but I feel there is a lot more going on with that one than Warstone. It's more covered, I know it's had more problems with drugs. It's just more atmospheric. It's a space that you can feel safe in but do feel like you have to be alert the whole time" (interview with Christina, 02/08/16)

> "This one [Key Hill] is much more run down and it's got much more character. There is a little bit here which looks like a fairy tale which I have taken you through which I particularly like" (interview with Amanda, 23/08/16)

The cemetery was placed at the (then) edge of the city with high walls, hedges, and railings: physically and symbolically separating the spaces of the living and dead (Rugg, 2000); however, it has now become a recreational green space for dog-walking or less virtuous

[128] The theory of the uncanny has been adopted by a variety of scholars, including Cixous, Heidegger, Marx, Nietzsche, and Wittgenstein.

recreational purposes as detailed by Christina. Therefore, the uncanny nature of the cemetery arises from the blurring between life and death, sacred and desecrated, but also real and fantasy. Indeed, Amanda believed that a part of the cemetery looks "like a fairy tale" (interview with Amanda, 23/08/16).

Hélène Cixous (1976, p. 527), in her reading of *The Uncanny*, argues that the uncanny is a repressed desire and "no stranger to that which may be construed as an adventure". Although Cixious (1976) later critiques the theory, arguing that the uncanny is about Freud's connection with Hoffman[129] and his desire to be a creative writer, the idea that the uncanny is a repressed desire is a useful notion to unpick the participant's connection with, or attraction to, the derelict sites. For example, if we consider the ruin as a merging of nature and culture (cf. Simmel) with a human's desire for natural environments (cf. Kaplan & Kaplan, 1989; Maas et al., 2006; Ulrich, 1993) it could be argued that encountering a ruin reminds one of their yearning for nature. This study, however, suggests that the interest (or desire) in the uncanny is because it is a new experience of the past within the modern urban environment that is normally so familiar and predictable.

> "It is sad seeing buildings so derelict but I also think they are beautiful as well. I quite like the image of peeling paint. I did stop at one point and take a picture of ghost sign. You don't see many of them and they are beautiful in their own way" (interview with Mandy [Jewellery Quarter worker, Female, 35-44-years-old], 09/09/2016).

On Mandy's walk, she encountered a variety of ruined and derelict structures (Figure 8.18), where she had spikes in EDA and increased fluctuation in BVP, implying that she was amused. But this amusement was not only because of the desire for a new experience but also her interest in things associated to the past:

> "I like bits where you can see bits of the past where the present hasn't been able to get rid of yet. I do a lot of the vintage and steam punk so I spend a lot of my time doing stuff that gives me a sense of the past. So when I can see bits of it that are old on a building I get a connection with the past I guess. I like that" (interview with Mandy, 09/09/2016).

[129] E. T. A. Hoffman was the author of The Sandman, Freud's inspiration for the uncanny.

Thus, it could be argued that ruins and sites of dereliction have a nostalgic quality that induces a desire for the past. In the body of the ruin, the past is both present in its residues and yet no longer accessible, making the ruin an especially powerful trigger for nostalgia.

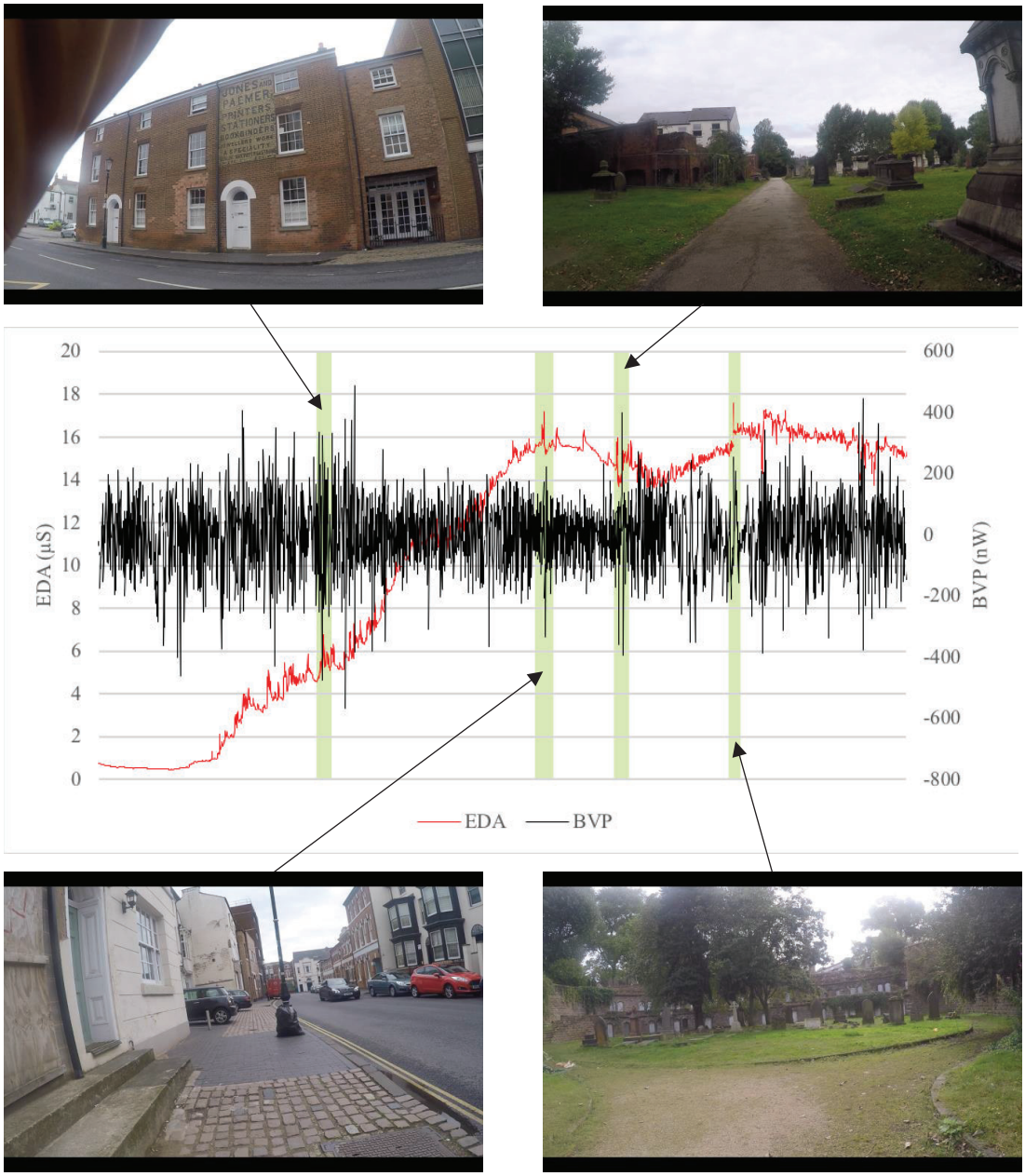


Figure 8.18: Mandy's EDA and BVP biodata with accompanying video stills (top left: ghost sign; top right: collapsing wall in Warstone Cemetery; bottom left: protruding plants and peeling paint on building; bottom right: catacombs in Warstone Cemetery). The highlighted areas are examples of sudden EDA peaks and increased BVP fluctuation (which would imply a state of amusement) which all occurred when Mandy encountered spaces of ruination.

Nostalgia for ruins

Hitherto it has been shown that ruins encompass and represent a variety of qualities including beauty, tragedy, memory, history, nature, and loss. Mandy's example shows how the ruins reflect the romance of the past and history of the area, but also simultaneously the neglect and commodification. More often than not, modern ruins are a result of the processes of capitalism, and as such there is an uneven distribution in the treatment and management of ruins and derelict buildings.[130] Only certain buildings in certain areas are maintained or renewed leaving others to disrepair (Jakle & Wilson, 1992; Mah, 2012). And this is also reflected within and between the three case study areas in this study where the heritage buildings in Bournville and Moseley are protected and maintained, but the buildings in the Jewellery Quarter are typically renovated only when there is a financial incentive to do so. Even within the Jewellery Quarter, there is an uneven spatial distribution of ruination, with the western areas having a higher proportion of ruination compared to the more profitable areas towards the (north)east (cf. Figure 8.11).

Even so, this discussion has shown that the ruins, despite their physical state, remain connected with the urban fabric that surrounds them: with communities; with collective memory; and with people's livelihoods and stories. Indeed, many scholars have researched the role of memory and belonging in relation to industrial ruination (see, for example, Edensor, 2005a; Emery, 2018; Mah, 2012). But unlike these studies, the majority of the residents in the Jewellery Quarter did not have a personal tie with those spaces due to their short residency in the area.[131] Even so, the participants from the Jewellery Quarter still had strong memories linked to those sites because of the strong commodification of memory in the area. Commodified memory refers to the production of memory that is situated and externalised outside of the local community (Edensor, 2005b; Misztal, 2002; van Dijk, 2004). Examples of commodified memory include the mediatisation of history and memories (e.g. History West Midlands, 2018), the commodification of 'authenticity' and nostalgia (e.g. Wesener, 2016), and the development and planning of 'historic' areas (e.g.

[130] The buildings often fall into disrepair because their listed status means that they can only repaired using specific (and often expensive) building materials and be used for certain (and often not profitable) purposes, rather than for residences or retail for example (interview with Karen [a property developer], 18/08/2016)

[131] Those participants in Moseley and Bournville who discussed the ruined spaces typically worked as volunteers in those spaces or had a family history associated with those spaces.

Jewellery Quarter Development Trust, 2013). The Jewellery Quarter prides itself on its industrial heritage, with one participant referring to the area as the "the workshop of the world" (interview with Christina, 02/08/16). The heritage policies and infrastructures in the area (such as those given as examples above) support the argument which describes the area as "at the centre of manufacturing for many years" and "a unique historic environment" (Belle, 2018 n.p.).

The ruins and derelict buildings in the area, however, simultaneously contradict and support the narrative articulated by the heritage industry. This is because these structures are a material form of nostalgia; they simultaneously represent the loss of the industrial dominance in the area but also an authentic past that has not been commodified, which in turn bring a sense of continuity in an era of constant change. Wesener (2016) recently identified that residents of the Jewellery Quarter saw not only the derelict buildings but also historical façades as authentic qualities of the area, which is also supported by the participants in this study:

> "Rebecca [Jewellery Quarter resident, female, 25-34-years-old]: We've just bought the building and we are not allowed to do certain things. We can't add a big huge spire on the top and we put some signage out the front.
>
> Interviewer: Does that restrict the area in anyway?
>
> Rebecca: I think it benefits it. What's unique about the Jewellery Quarter is that it needs to be protected and that keeps it looking old fashioned. But it puts it in a positive way" (interview with Rebecca, 18/08/2016).

Most forms of heritage promote a feeling of sense of place and remind us of a history as we look to the future (D. C. Harvey, 2001). All heritage resources are non-renewable and irreplaceable and, as such, require conservation and management, such as those suggested by Rebecca. Even so, there are demands put upon the area's infrastructures and buildings meaning that the old buildings are often renovated and reclaimed to fulfil the needs of the area. Amanda [Jewellery Quarter resident, female, 55-64-years-old], however, was disillusioned by the reclamation and renovation of the previously derelict factory buildings:

> "They were old factories and of course they are not factories anymore. It's a conundrum. Until we get planning permissions sorted we will have buildings dripping in buddleia and that's a blight, but then that's more true than turning them into flats" (interview with Amanda, 23/08/2016).

These conversions that facilitate the provision of lifestyle and traces of the past typically involve the gutting of the original building whilst cleaning up the tradition façade or exterior. Edensor (2005a) argues that the production of historical districts with reclaimed/renovated building only have selected traces of the past, hence if the landscape is seen as a palimpsest it can be difficult to decipher with its preserved appearance. Even so, the renovated buildings are still valued, and the new developments are deemed 'heartless'.

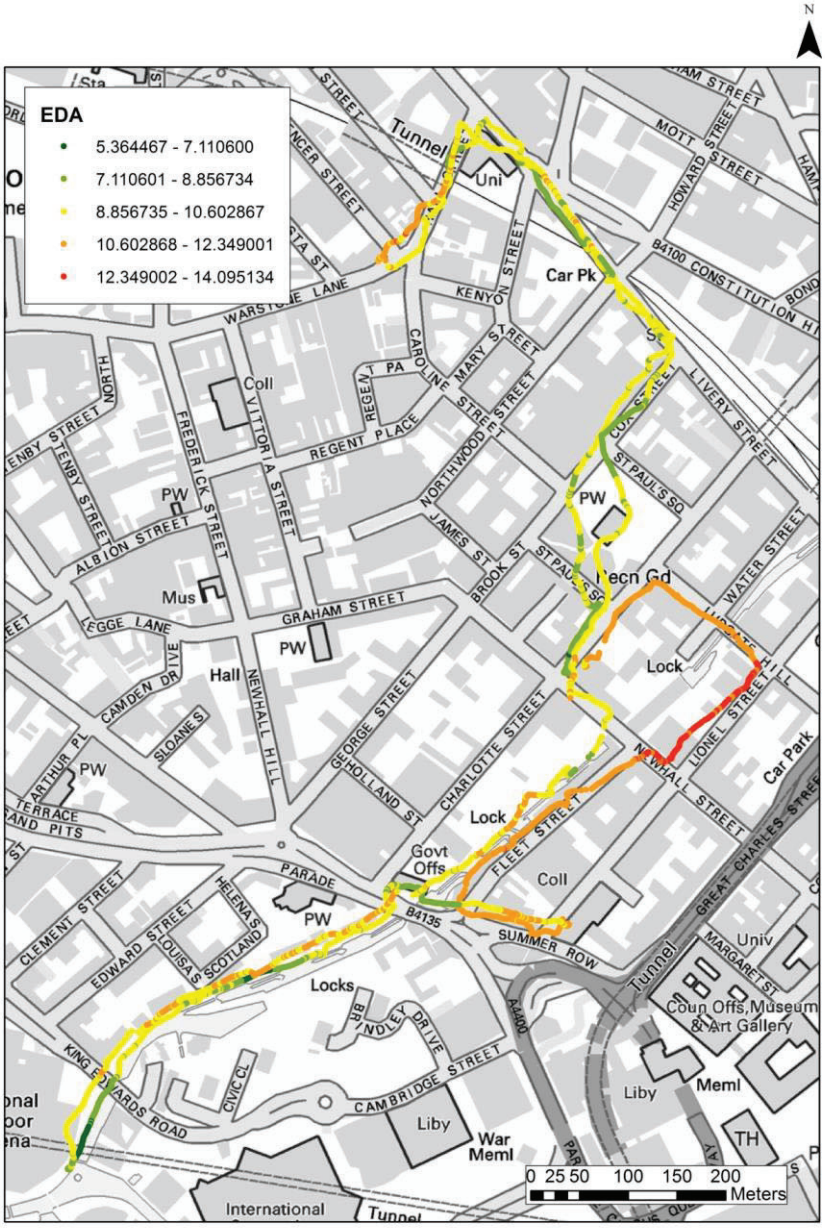


Figure 8.19: Owen's EDA biomap - the section of high EDA activation along Lionel Street was due to the participant's dislike for/anger towards the new blocks of buildings that are 'heartless' and without character, unlike the older buildings of the area.

Ruins, however, are the indissoluble combination of spatial and temporal desires that trigger nostalgia and way to re-examine our relationship with the past (DeSilvey & Edensor, 2012; Huyssen, 2006; Pálsson, 2013). As Eshel (2010, p. 135) argues, ruins are not solely the "material manifestation of a fascination with destruction and demise … [but they] also enable us to think about the historicity of our condition and even experience hope". Perhaps this is why there has been an increased interest in the 'antitourism' of ruins and derelict sites in recent years (DeLyser, 1999; Edensor, 2005a; Garrett, 2011a, 2012; Pálsson, 2013). These discussions of ruination or dereliction, however, tend to over-romanticise the nostalgic qualities of those spaces. As the previous chapter has demonstrated, nostalgia – as a bittersweet longing for the past – links temporal and spatial desires for something that is absent in the present. Huyssen (2006, p. 8) argues that industrial ruins, such as the auto-factories of Detroit and the steelworks of the Ruhr now have nostalgic properties because "they hold a promise that has vanished from our own age: the promise of an alternative future". Perhaps this is why the Jewellery Quarter's industrial past is promoted and valued by the residents and planners. Regarding the ruins, however, preservation and heritage policy can hinder the processes of decay and ruination – therefore the concept of preserving ruins, even for nostalgic value, is an oxymoron.

8.3 CONCLUSION

This chapter has discussed two examples of heritage that represent the blurring between nature and culture but are also part of the residents' everyday engagement with their neighbour. Thus, the discussions on post-*rus in urbe* estate and ruins consider the definitions of living heritage put forward by both policy makers (UK Government, 2019; UNESCO, 2013) and academics (Baillie, 2013; Miura, 2005; Ramshaw, 2010). Whilst both post-*rus in urbe* and ruins are formed from the hybridity of natural and cultural processes over time, their meanings are enriched by the understandings and value ascribed to them by the resident population (e.g. the Angry Wall and the Peace Garden in Highbury Park). Yet, the residents' engagement with these sites are not consistent; indeed, the participant's diverse responses to the ruined spaces of the Jewellery Quarter eloquently demonstrate how histories can be

interpreted in different ways. Even so, this chapter has reflected upon the findings from the previous empirical chapters to understand why the psychophysiological responses were different. Crucially, this chapter demonstrates that whilst some residents may thoroughly enjoy the heritage in their local area (e.g. Tony and Mandy), for others it is simply part of their everyday, and therefore not a significant feature of the area. Indeed, it was shown in the previous chapter that collective memories are not has psychophysiologically provocative as their personal experiences. Even so, this chapter is one of a few studies to consider living heritage that moves beyond tourism and conservation to consider the mundane aspects of heritage to demonstrate the value that the residents ascribe to living tangible heritage.

The initial discussion on the post-*rus in urbe* of Highbury Park introduced two obvious examples of historical human-nature interactions: agricultural and horticultural practices. Tony's account of the park demonstrates how a variety of engagements with the landscape (such as imagination, memorialisation, restoration, and education) can shape people's connections with the landscape. Crucially, the example of Highbury Park shows the hybridity of heritage within a space where a single manifestation of heritage has a multiplicity of meanings and narratives. Thus, Highbury Park demonstrates how a heritage-rich landscape can act a depositary of meanings, narratives and symbolism that is constantly in flux. The other half of this chapter on ruins, however, unpicks a variety of ways to understand the psychophysiological evocative qualities of spaces of ruination and/or dereliction. The participant's responses to the ruins were varied across the three areas, and as such, the section has discussed a few ways to interpret ruined spaces namely, as a battle between nature and culture (cf. Simmel, 1958), a space that stimulates a more sensually-attuned body (cf. Edensor, 2007), an example of the uncanny (cf. S. Freud, 2003b), and as a nostalgic materiality. It has demonstrated the complexities of these spaces that encompass different temporalities, sensory and emotive qualities, and meanings.

Combined, these two examples of heritage that blur the cultural and natural dichotomy and as a result represent a biosocial for of heritage and demonstrate the importance of these types of sites in the urban landscape for the residents. Both sites provide a connection to the past, the natural world, and experiences that are very different to the typical blandscapes of the built environment (Edensor, 2005a). Crucially, however, these examples of heritage contain a historical presence and new meanings such as the Peace Garden in Highbury Park or the nostalgic qualities of the ruins. The key difference between these forms of living heritage

and traditional forms of commodified memories is the role that imagination plays in the perception of the sites. For example, Tony's account of the old field boundaries and Mandy's interest in the ghost signs and other industrial traces demonstrates the importance of imagination in evoking a psychophysiological response. As such, this chapter stresses the importance of living heritage for the residents that is not overly commodified and/or 'reconstructed' but also how a variety of features (building upon the previous empirical chapters), not just the history of an area, evoke a psychophysiological response,

9

CONCLUSION

This thesis has conceptualised biosocial geographies of emotion and critically developed a methodology for doing those geographies – with a focus on urban conservation areas and heritage as a case study. In doing so, it has established a new approach for geography which incorporates the new discoveries and methodologies from the affective sciences and considers the biological processes of the body in the wider world. This approach has been pursued through a variety of focuses and scales, from the broad scale of the body-environment relationship to specific heritage features in the case study areas, demonstrating the versatility and possibilities of biosocial geographies. By taking this innovative theoretical and methodological approach this thesis has three key empirical findings: firstly, it has uncovered smaller aspects of the environment that can stimulate either a stressful or restorative psychophysiological response. Secondly, it has shown how the processes of memory and nostalgia can be emotionally rich; not only in how experiences of nostalgia can stir the body, but also how it can have a major influence on the relationship between the body-subject and the environment. Finally, this thesis has explored two interconnected notions of living heritage to demonstrate the importance of these features for the current residents, stressing that the fossilisation and commodification of heritage are not the only valued aspects of the historically-rich landscape.

This chapter will consider the theoretical, methodological, and empirical contributions made by this thesis in turn. In the first section this chapter will discuss the establishment of a biosocial geography undertaken in this thesis and how it has built upon and developed

studies of emotion and embodiment in the discipline. The second section then turns to the methodology developed to undertake this biosocial geography of emotion with the use of interdisciplinary mixed methods and an integrated analytical framework. Within this discussion there is a critical evaluation of biosensing technology in terms of both its practical application but also how it could benefit existing geographical theories, such as NRT and visceral geography.

9.1 ESTABLISHING BIOSOCIAL GEOGRAPHY THEORY

The most significant contribution of this thesis is the development and application of a novel theoretical approach for understanding the emotional body: biosocial geography. The biosocial is a growing theoretical approach in the social sciences with scholars from childhood studies and education (Youdell & Lindley, 2018), criminology (Beaver et al., 2015), and sociology (Meloni et al., 2018). And even though geography has increasingly placed an emphasis on the body and the (im)material world, it is yet to consider all the possibilities that a biosocial approach could bring to the discipline. By incorporating methods and knowledges from both the biological and social sciences, this thesis has addressed these theoretical and methodological gaps and paves the way for a new geography: a biosocial geography which can interpret the dynamic biological flows as well as the influential social forces that meet in and comprise the body-in-world.

Applying biosociology in geography

The biosocial approach, through its active incorporation of biological knowledge and methods within social science, seeks to abandon biophobia or fears of biological determinism to consider the ensnared feedback loops between biological and social processes to better understand human behaviour and agency. This approach has been shown to be effective in fields such as childhood studies (Prout, 2005; Ryan, 2011) and criminology (Beaver et al., 2015; Wright & Boisvert, 2009), but many of these studies have not considered the complexities and intricacies of space and their effects on human behaviour

and agency. As such, a biosocial geography is in an opportune position to study human embodiment as a combination of biological and social processes but also how these processes influence and are influenced by the environment. This biosocial geography, therefore, is able to consider the spatial element lacking in biosociology and incorporate biological insights and methods into geography.

It is important to note, however, that an interest in biology is not entirely new for geography with the work being undertaken by (postmodern) feminism, non-representational theorists, and visceral geographers (detailed in Chapter 2). And whilst there may be some that consider these scholars to be undertaking biosocial research (A. Hayes-Conroy, 2009) since they see the human subject as a hybrid entity that dissolves the mind/body, nature/culture, mental/physical dualisms, this thesis has demonstrated how biosocial geography pushes these understandings of the body further. Indeed, biosocial geography allows for the study of embodied phenomena which were previously overlooked or poorly understood (such as blood flow, hormones, and brain activity), but also builds upon an exceptional history of embodied research in the discipline and brings a spatial element to the biosociology in the social sciences in general.

Emotional biosocial geography

The strengths of biosocial geography are especially apparent in the study of emotions where there is the opportunity to incorporate the new discoveries of the affective sciences to investigate the psychophysiology of emotion. For a long period now, the affective sciences have been using advanced technologies (such as biosensors) to measure and quantify somatic responses to postulate emotion-specific activity in the ANS (see, Kreibig, 2010 for a review) and thus provide new understandings of the relationship between the activity of the ANS and emotions. And whilst the connection is disputed (Feldman-Barrett, 2006; Stemmler, 2009), the relationship between ANS activity and emotion remains a significant interest for affective scientists, who have uncovered new understandings surrounding the nature of emotions and the testing various theories of emotions. Additionally, these studies have the capacity to enrich scholarship's understanding of the consequences of emotion, including how emotions influence other psychophysiological processes (such as attention, learning, and memory) as well as how emotions can impact upon mental and physical health, and well-being (Levenson, 2014).

By incorporating these rich understandings from the affective sciences and applying them in geographical enquiry it addresses geography's minimal engagement with or knowledge of the biological, neurological, or psychological factors that make up the subjects under investigation. I have argued, and demonstrated, that by using these understandings and methodologies from the affective sciences, an emotional biosocial geography provides the opportunity to measure and identify the *intensity* of emotion (and/or affect) (cf. Chapter 2), and thus, provide new branches of enquiry for affectual and emotional geographies and (re)link emotional geography back to the physical body.

A biosocial future for geography?

With any study that considers and actively incorporates biological or scientific measurement, it is always susceptible to the well-established critiques namely that it encourages a masculinist 'god-trick' objectivity (Haraway, 1991; L. McDowell, 1992; G. Rose, 1993), rejects metaphysical questions (Buttimer, 1976; Tuan, 1976), and is deterministic (Hall, 2000; Renwick, 2012). The biosocial approach developed in this thesis, however, moves beyond simply incorporating biological knowledges and methods into geographical scholarship; biosocial geographies is a relational endeavour considering the connections beyond bodies but into the internal processes and its milieu (including the socio-cultural, political, and (im)material worlds). In doing so, biosocial geography allows scholars to traverse the social/biological binary which avoids the pitfalls of determinism and 'god trick' objectivity by consolidating the strengths of existing geographical epistemologies in order to consider the relatedness of biosocial worlds (cf. New Materialisms & ANT), the importance of (bodily) difference (cf. Feminism), and the ineffable and immaterial (cf. NRT). By recognising relatedness, biosocial geographers are able to move beyond simply acknowledging existing biological processes by critically interrogating their roles within the world's networks.

This development of biosocial geographies provides two main avenues of enquiry for geography, but also the biosocial movement in the social sciences. Firstly, it will allow geographers to investigate and incorporate embodied phenomena, what Hall (2000) terms the 'blood, brains and bones', which were previously overlooked, poorly understood, or dismissed within geographical scholarship. Not only does this allow geographers to

critically consider the important internal processes of the body in their enquiries, but it has also been shown how an incorporation of biology can enrich established areas in geography, such as therapeutic landscapes (Chapter 6), memory (Chapter 7), and heritage (Chapter 8). Furthermore, a biosocial geography can also bring a spatial element to the growing body of biosocial work in the social sciences more broadly. Whilst biosocial scholars in sociology, for example, have used a biosocial approach to reconceptualise selfhood (Higgins, 2018), the body (Pálsson, 2016), and human life (Ingold & Pálsson, 2013) a consideration of the role of space or the environment is rare[132] and a practical application of a biosocial approach is even rarer. Hence why this thesis not only established a biosocial approach tailored for geography, but also developed a methodology for undertaking a biosocial approach.

9.2 A METHODOLOGY FOR BIOSOCIAL GEOGRAPHY

In tandem with the development of a biosocial geography, a second key contribution of this thesis was to establish a methodology for investigating people's emotions biosocially. The biosocial approach applied in this thesis was an example of interdisciplinary mixed methods, which not only used biological and social methods in parallel, but also integrated different types of analyses and datasets from different disciplines namely the social and biological sciences. The methodology adopted was founded on methodological experimentation (Fitzgerald & Callard, 2015) which provided an ethos of openness by ensuring that there are no boundaries between disciplines or ownership of specific objects of knowledge. In the last two decades, there has been an increasing interest in interdisciplinary research especially in the humanities and the social sciences with the ongoing calls for cross-disciplinary collaboration (e.g. AHRC, 2017; ESRC, 2014). These calls and increased interest in the interdisciplinary are encouraged and enhanced by the technological and methodological developments in the natural sciences, which have allowed social scientists in particular to

[132] A notable exception is 'Being human: brain-body-environment entanglements' in Youdell and Lindley's (2018, pp. 56–76) book which explores the becoming of a person and how that is related to the brain, body, and environment.

use these measures (such as biosensors) in non-clinical setting. Indeed, this study is one of the first examples of biosensing technology used out of a clinical-setting. The biosocial interdisciplinary mixed methodology adopted here incorporated social and (traditionally) clinically-based approaches to consider the complex interplay between social, environmental, and biological processes – a biosocial geography. In this study four multidisciplinary methods (biosensing, video, emotional mapping, and video elicitation interviews) were applied and analysed following the philosophy of *a methodology of dynamic reciprocal constraints* (Varela, 1996). As such, it was acknowledged that each individual method did not provide an empirical truth alone, yet the combination will provide a more robust understanding of the relationship between the biosocial body and the environment. This combination of methods not only provided additional confidence in the data sets through integrated analyses, but crucially was able to produce a multifaceted account of the body-landscape with each method capturing a different aspect of the interplay between social, biological, and environmental processes for each participant. This novel methodology, as well as producing a variety of findings, made two substantive and novel contributions to geography and the social sciences: the use of biosensing technology in geography and the development of integrated analyses to develop a biosocial account.

Biosensing technology in geography

This study has demonstrated the strengths of biosensing technology as a novel method used to incorporate biological/physiological measurements within an interdisciplinary mixed methodological approach. Even though biosensors have been used prior to this research (de Freitas, 2018; Nold, 2009; Ruskamp, 2016; Zeile et al., 2015), the use of them within geography (and the social sciences in general) has been extremely limited. This study has shown how biosensors are an exciting opportunity for geographers, especially those interested in emotions, memory, place attachment, and health. Despite the opportunities to quantify and measure psychophysiological reactions and incorporate biological knowledge, biosensing should be treated with caution. Whilst the use of biosensing can generate insights into individual level affects, 'knowing' what people think and feel is an issue of biosensing. Thus, these new ways of knowing produced by biosensing "are caught up with new expressions of power … [which] like the apple in the fairy tale, have the ability to poison how we live" (Thrift, 2011, p. 23). Biosensing reduces the body to a series of numbers and there is a consequential risk that the participant's body could be viewed as a 'complex

information network' (Lupton, 2012), therefore removing the subjectivity of the individual. As such, biosensing data (alone) needs to be treated with caution and be cross-examined within a suite of methods to consider the rich personal narratives of each participant to gain a deep understanding of the body-subject.

Within the methodology established in this thesis (also see T. Osborne & Jones, 2017), biosensing has been shown to be a methodological tool with great potential in geography that uncovers new interpretations about the body and consequently the body-landscape relationship. This study, however, is an early example of a biosocial methodology and there are opportunities to explore different types of biosensing technologies and respond to the call for more 'viscerally aware' methodologies within the social sciences (Hayes-Conroy, 2017; Sexton et al., 2017). This study used the Empatica E4 wristband, a dry biosensor with four measures yet there are many commonly-available biosensing equipment which can be used to explore a plethora of physiological reactions in many areas of geography and the social sciences in general and in relation to different geography theories (cf. Chapter 2). Furthermore, there is also the possibility to incorporate wet biosensors within this biosocial approach which not only enhances the scientific/biology aspects of the research but could also lead to increased collaborative opportunities between the social and natural sciences as a result of practical and ethical implications (discussed in Chapter 3). Cortisol, for example, is frequently used as a biomarker for stress and related diseases and health conditions because it can be reliably measured from salivary, blood, or hair samples (Hellhammer et al., 2009). Unlike the EDA measurement used in this thesis, measuring cortisol secretion can provide a long-term measure of stress response allowing researchers to move beyond immediate stress response.

It was shown in Chapter Two how geographical scholarship has already developed a collection of theories that understand the body as a hybrid or network of socio-physical entities (cf. NRT, New Materialisms, visceral geography), yet biological methodologies are rarely used for empirically-based work in geography. Thus, it could be argued that using such methods in these theoretical frameworks could not only enrich geographical inquiry but also develop those theoretical frameworks. For example, Benedikt Korf (2008, p. 717) suggested that there is an overlap between NRT and neurobiology due to NRT's interest in embodied cognition which is "a dynamic trajectory, which incorporates not only microkinetic nerve languages but also all sense, including affection, and performativity".

And whilst NRT focuses on the ineffable and nonrepresentational aspects of experience, emotion, and affect, the use of physiological or neuroscientific measures provides the opportunity to measure and identify the *intensity* of these phenomena (cf. affective capture - Massumi, 2002). Furthermore, Allison Hayes-Conroy (2017, p. 52), who was inspired by the combined social-biological perspective, recently called for a consideration of new methods for visceral geographies by posing the question: "what methods might be used to trace the environment into the body and the body into the environment?". I have shown that the biosocial approach, with the use of biosensing technology, is one of the possible answers to this question.

Establishing integrated analyses

In order to fully integrate the four methodological tools and their datasets, a novel iterative analysis strategy was developed for this thesis. The three cross-analyses each focused on emotional events uncovered in an initial data set (i.e. maps, coding matrix, or the biodata), which was then cross-examined with the other data (Figures 3.14, 3.15, & 3.16, p. 76). These combined cross-analyses were developed by extending upon Knigge and Cope's (2006) grounded visualisation which draws upon feminist, critical GIS, and grounded theory to integrate GIS and qualitative methodologies. The analyses developed in this thesis, however, was a more holistic analytical approach take could be used in any project involving multidisciplinary methods, not just GIS and qualitative methodologies. By using this approach, this study was able to compare and contrast (heuristically and reflexively) the subjective accounts of the interviews with the multi-representational space(s) of the (e)motional maps and the biodata, and vice versa. This analytic approach was not only able to consider and evaluate the four data sets effective but was also exploratory and experimental (cf. Fitzgerald & Callard, 2015), iterative and recursive (Philip, 1998), able to consider particular instances and general patterns (cf. Bailey et al., 1999; Strauss, 1987), and multiple views and perspectives for building knowledge (cf. Reinharz & Davidman, 1992). As such, these combined analyses allow biodata to be used in research beyond reductive mathematical correlations (such as Shoval et al., 2018a, 2018b) to provide iterative and recursive explanations (Spinney, 2015). Thus, this framework has subsequently been adopted in another study on the exploration of video game worlds looking at how individuals create and navigate these virtual landscapes (T. Osborne & Jones, 2017), demonstrating how

this analytical framework can be used to observe and analyse different research focuses, such as postmemory (P. I. Jones & Osborne, 2018).

9.3 ON PSYCHOPHYSIOLOGICAL REACTIONS

The findings of this investigation range from specific sites and events to the body-environment relationship more broadly and as a result there were some cross-cutting themes that emerge and allow biosocial geographies to provide new understandings of the body-environment relationship from different scales and perspectives. Taken together they represent a compelling and original picture of the emotional relationships between people and the urban conservation areas in which they live and work, but also shows how this approach can be taken beyond urban conservation areas. The thesis has uncovered and discussed some of the participants' psychophysiological responses to their surroundings, demonstrating how these biosocial experiences occur across different scales, are dependent on the subjectivities of the individual, and enrich the notion of place. Chapter 6 looked at the experienced, symbolic, and social aspects of specific urban conservation areas in Birmingham by expanding on the therapeutic landscapes framework from health geography (Bell et al., 2018; Gesler, 1992; Völker & Kistemann, 2011). In doing so, the chapter moved beyond traditional research interested in therapeutic landscapes to identify and discuss the various smaller and specific features of the environment that stimulated a (psychophysiological) stressful or restorative reaction across green, blue and grey spaces. Chapter 7, on the other hand, reflected on the relations between body, the environment, emotion, and memory. By looking through carefully chosen examples of memory, Chapter 7 identified and discussed some of the psychophysiological responses whilst also reflecting on how these nostalgic events feed into notions of belonging, community, and home. Even though the processes of nostalgia did contribute to a sense of place, it was shown how the personal and individual memories (over collective memories) stimulated a stronger psychophysiological reaction. Finally, Chapter 8 uncovered why there were minimal and often opposing psychophysiological responses to the heritage features within the whole data set by focusing on two examples of 'living heritage' (a historical park and ruins) and viewing

them through different theories, such as cultural landscapes and the Freudian uncanny. In doing so, Chapter 8 demonstrated that the participants who were involved in heritage conservation were more likely than the other residents to have an emotional connection with those sites. Whilst heritage is an attractive quality for an area it is only a small piece of the resident's connection with their neighbourhood. Although the empirical chapters focused on different aspects of an urban conservation area (environment, memory, and heritage), there are some themes that can be drawn out across the chapters; namely the importance of scale and how the experiences are differential. Before discussing these overlapping themes, however, it is important to critically reflect upon the emotional 'event's that have been presented in this thesis over the passive or less responsive moments in the data set.

Considering absences or 'uneventful' data

A number of mobilities scholars have argued that mobile methods have a tendency to focus on the active or eventful aspects of mobility over passivity or quiescence[133] (Bissell, 2010a; Merriman, 2014; Spinney, 2015). This thesis has discussed the various emotional events that have occurred in relation to the physical environment, moments of nostalgic memories, and spaces/features of heritage yet a number of the participants did not have strong or 'active' emotional responses to these phenomena after analysing the biodata. Although scholars are increasingly reflecting on their failures in research (cf. Harrowell et al., 2017), it is important to stress that the various 'uneventful' biodata-sets are not a failure of the methodology developed in thesis, but instead demonstrate that some of the participants had little connection with the places in question. As such, these 'uneventful' walks demonstrate the importance of considering the socio-cultural contexts of the biodata.

These absences in the biodata as a result of social framing is especially apparent in relation to heritage in 'Nature-Culture & Heritage', where the chapter focused on those who either worked or where extremely interested in heritage. Tony, for example, was a volunteer for the Highbury Community Orchard and had spent a large quantity of his time working to preserve and celebrate the living heritage of Highbury Park. Martin, on the other hand, had little to no reaction to the heritage features of the Jewellery Quarter compared to those who had strong connections to the heritage industry (i.e. Karen, Rebecca, Mandy, and Tony).

[133] Quiescence is a term used by Bissell (2009, 2010a) to describe some of the passive aspects of being mobile, such as lethargy, pain, and hunger.

Despite Martin's apparent lack of eventful biodata (Figure 9.1), he discussed how the traffic noises outside his apartment were having a major impact on his life (cf. '*Noise & conflicting attentions'*), thus demonstrating why emotional connections to a place/event/phenomena should always have a socio-cultural context in relation to the participant.

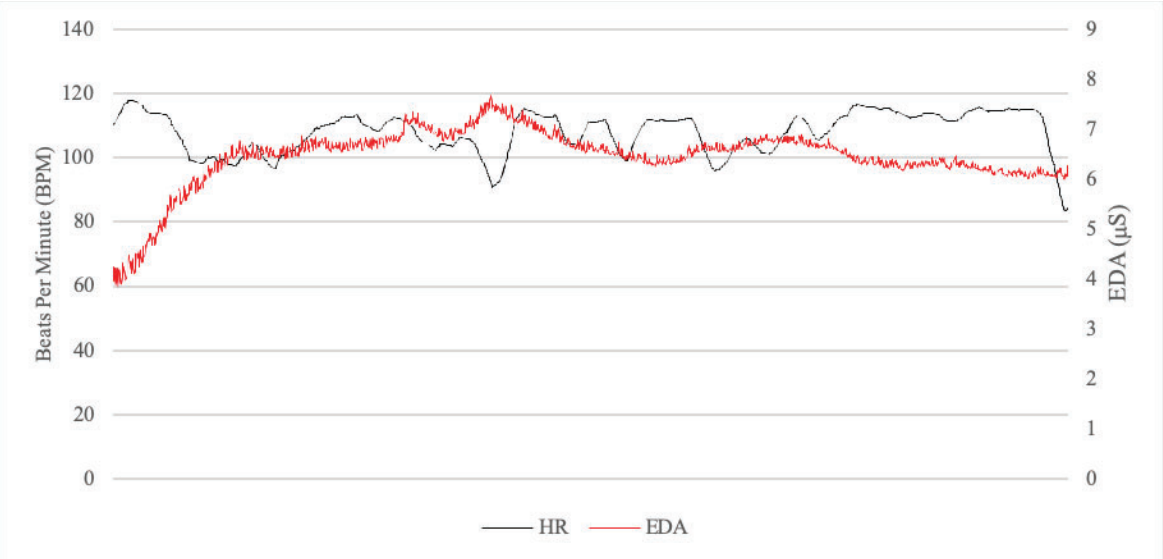


Figure 9.1: Martin's EDA and HR biodata

Spatial and social scales

Comparing Chapters 6 and 7, specifically, it is apparent that the intensities of psychophysiological responses are dependent on scale: both socially and spatially. In Chapter 7, for example, Dan's exploration of his childhood haunts (including his old school, park, and scout hut) stimulated higher fluctuations of BVP ($x \leq -2\sigma \vee x \geq 2\sigma$) compared to spaces where he had community-based memories ($-2\sigma < x \vee 2\sigma > x$), such as Carols on the Green (cf. Figure 7.2, p. 192). Dan's example (as well as other examples of personal nostalgias detailed in the chapter) demonstrate that individual/personal memories stimulate a more intense psychophysiological reaction than collective memories; hence it could be argued that the smaller the scale of the memory, the stronger the psychophysiology. Similarly, Chapter 6 showed that it was the particular features of a place that evoked a stronger psychophysiological reaction compared to the space as a whole. For example, Michelle's biosensing data from her walk along Salisbury Road, Moseley (Figures 6.6. & 6.7, p. 155) were able to identify the specific moments when a (heavy) vehicle passed her. Michelle's example demonstrates the specificity of these psychophysiological 'stressful' moments and while prolonged time in the whole environment (such as a road or a park) may

lead to an overall increase or decrease in psychophysiological stress (Abbott, 2012; A. C. K. Lee & Maheswaran, 2010), it is important to reflect on the particular features that encourage those reactions such as water (e.g. Valley Parkway Boating Lake), sensory experience, and, in Michelle's example, heavy vehicles. And by identifying these features through future research, it may also be possible to advise small-scale changes to the urban fabric for increased psychophysiological restoration and address the challenge of urban stress (as discussed in Chapter 5).

(Differential) biosocial experiences

It was demonstrated in Chapter 2 how there are important biological methodologies and knowledges that are often overlooked or misunderstood within geography, and the social sciences more broadly. But this thesis has shown that by identifying, tracking, and measuring some of the biological aspects of emotional response, it is possible to understand how some biological processes can influence embodied experiences. This phenomenon was especially prevalent in the Chapter 7 where places of memory enriched a person's place attachment and connections with the community (cf. to belong is to be *be-longing* - Probyn, 1996) and this feeling can be enriched if it is an especially emotional memory as a result of the neurological reactions in the limbic system. Both Chapters 7 and 8 demonstrated how psychophysiological responses are a significant feature of experiencing the past, but also demonstrated how the relationships between body and environment are differential. In Chapter 8 specifically, it was shown that while some people experienced those living heritage sites (or spaces more generally) in a biosocially positive way, others were shown to experience negative feelings in/about the same features (cf. ruins and dereliction). As such, these psychophysiological responses are neither fixed nor predictable; instead, it has been shown how they are constantly changing and adapting as the body interacts with its milieu. The findings from this study therefore support the notions that human biology (Malabou, 2008) and sociality (J. Horton & Kraftl, 2006) is continuously shaped and reshaped; thus, humanity is a biosocial becoming (Ingold & Pálsson, 2013).

With this consideration of differential body-space relations, there is an opportunity to use the biosocial approach established in this thesis to investigate the importance of social difference, such as gender, class, race etc., and boundaries. Indeed, it has been shown in the secondments to this project that a person's past experiences and subjectivities can influence

their psychophysiological reactions (P. I. Jones & Osborne, 2018; T. Osborne & Jones, 2017). Thus, there is scope to explore and reflect upon how heritage(s) can affect the body differentially and how they contribute to the creation of social differences and boundaries, therefore providing guidance for heritage policy makers and professionals to make these spaces more inclusive. Crucially, however, there is the opportunity to move beyond heritage as a focus and explore other cultural institutions (such as art, music, or religion) and areas of geography through a biosocial approach.

9.4 FINAL REFLECTIONS

Biosocial geography extends geographical knowledge to incorporate both the external and internal processes of the body, but also crucially the body's social and biological worlds in tandem. In geography there has been a shift in attention away from the biological nature of the body (either because it was deemed masculinist, deterministic, or objective) towards the role(s) that the body has in social worlds. I have shown, however, that a union of theoretical and methodological developments in the natural sciences and the growing considerations of the biological body in geography can extend geography's knowledge of the body so that it is able to consider and interpret both the dynamic biological flows and influential social forces that meet in and comprise the body-in-world. This thesis has shown that the inclusion of the materiality and biological processes of the body in geographical research enriches understanding of the body, its processes, and the body-environment relationship. I have shown a possible way of reconceptualising biology within social science so that an biosocial interdisciplinary investigation is fruitful but does not fall into the traps of determinism and objectivity. This is achieved through three means: understanding the body-subject as a biosocial becoming; considering the biosocial body's relatedness to the world and other; and developing a novel methodology for examining these biosocial worlds.

First, the human organism is not seen as a fixed biology entity; instead this biosocial approach fully appreciates that the body-subject is constantly changing. These changes, what Steven Rose (1997) terms '*homodynamics*', occur both within the body (cf. Malabou, 2008)

and between the body and social processes (cf. Ingold & Pálsson, 2013). In this manner, social processes become part of the body and the biological body influences the social. Second, and crucially, these biosocial flows are interpreted within the wider world, including the (im)material networks. As such, the biosocial approach is not individualistic but understands that the biosocial being influences and is influenced by other actors. And whilst in this thesis, I have focused on temporality and the physical environment, there is opportunities in future research to explore the relationship between the biosocial being with economic, political, cultural etc. flows. Thirdly, the novel methodology developed for this study, whilst challenging to undertake, produced a robust measure for researching body-landscapes through thorough cross-examination that is exploratory, iterative and recursive, and allows for multiple subjectivities - thus, overcoming the common critiques of biological investigation. Furthermore, the methodology produced a multifaceted account of the body-landscape with each method capturing a different aspect of the interplay between social, biological, and environmental processes for each participant which when then combined through an integrated analytical framework to uncover new understandings of the body-environment relationship.

This thesis follows a series of developments in geographical scholarship which has actively and critically considered the significance of the body and embodiment (i.e. embodied geographies). Traditionally, studies of the body or embodiment in geography have encompassed the spatiality of bodies, the affective and performative aspects of being, and the interrelationship of body and place/space. As a result of embodied geography's theoretical grounding in (post-)phenomenological, feminist, and relational approaches, there has been an emphasis on emotion/affect, performativity, and the body as a site of meaning of social processes (Hall, 2000) which has broadly resulted in human geography's neglect of the body's biology. Indeed, Parr has argued that geographical engagements with the body neglect "the physical presence of the body" (1998, p. 28). This thesis addresses this gap in the embodied geography literature and proposes a new embodied geography which simultaneously recognises and incorporates the biological processes of the body and understands that the physiology of the body is not purely biological but situated in a complex network of biological and social processes in the (im)material world. The development of the biosocial body for geography not only encourages a new conception of the body, but pioneers new embodied, emotional, and social geographies enriched with new methods, theories, and empirical insights.

REFERENCES

Abbott, A. (2012). Stress and the city: Urban Decay. *Nature News*, **490**(7419), 162.

Aboutorabi, M., & Wesener, A. (2009). The Changing Pattern of Urban Form in Relation to the Perception of Happiness in Georgian Birmingham. In A. Bartetzky & M. Schalenberg (Eds.), *Urban Planning and the Pursuit of Happiness* (pp. 34–51). Berlin: Jovis Verlag.

Adams, D., & Larkham, P. (2015). Walking with the ghosts of the past: Unearthing the value of residents' urban nostalgias. *Urban Studies*, **53**(10), 2004–2022.

Adams, K. M. (2003). The politics of heritage in Tana Toraja, Indonesia: Interplaying the local and the global. *Indonesia and the Malay World*, **31**(89), 91–107.

Adams, M., & Guy, S. (2007). Senses and the city. *Senses and Society*, **2**(2), 133–136.

Adli, M. (2011). Urban stress and mental health. *Cities, Health and Well-being*, Urban Age: A Worldwide Investigation into the Future of Cities, Hong Kong.

Adli, M., Berger, M., Brakemeier, E.L., Engel, L., Fingerhut, J., Gomez-Carrillo, A., Hehl, R., Heinz, A., Mayer, J., Mehran, N. and Tolaas, S. (2017). Neurourbanism: towards a new discipline. *Lancet Psychiatry*, **4**(3), 183–185.

Agnew, J. A. (1987). *Place and Politics: the Geographic Mediation of State and Society*. Boston, MA: Allen and Unwin.

Ahmed, S. (2004). *The Cultural Politics of Emotions*. New York: Routledge.

Al-Kodmany, K. (2002). GIS and the artist: shaping the image of a neighborhood through participatory environmental design. In W. Craig, T. Harris, & D. Weiner (Eds.), *Community Participation and Geographic Information Systems* (pp. 321–329). London: Taylor & Francis.

Alarasi, H., Martinez, J., & Amer, S. (2016). Children's perception of their city centre: a qualitative GIS methodological investigation in a Dutch city. *Children's Geographies*, **14**(4), 437–452.

Allen, J. (2006). Ambient power: Berlin's Potsdamer Platz and the seductive logic of public spaces. *Urban Studies*, **43**(2), 441–455.

Anderson, B. (2006). Becoming and being hopeful: towards a theory of affect. *Environment and Planning D: Society and Space*, **24**(5), 733–752.

Anderson, B. (2009). Affective atmospheres. *Emotion, Space and Society*, **2**(2), 77–81.

Anderson, B. (2012). Affect and biopower: Towards a politics of life. *Transactions of the*

Institute of British Geographers, **37**(1), 28–43.

Anderson, B., & Harrison, P. (2006). Commentary: Questioning affect and emotion. *Area*, **38**(3), 333–335.

Anderson, K., & Smith, S. (2001). Editorial : Emotional Geographies. *Transactions of the Institute of British Geographers*, **26**(1), 7–10.

Andreassi, J. L. (2010). *Psychophysiology: Human Behavior and Phsyiological Response*. New York, NY: Psychology Press.

Andrews, G. J., Kearns, R. A., Kontos, P., & Wilson, V. (2006). 'Their finest hour': older people, oral histories, and the historical geography of social life. *Social & Cultural Geography*, **7**(2), 153–177.

Appleton, J. (1996). *The Experience of Landscape*. Chichester: Wiley-Blackwell.

Arbib, M. (2013). [Why] Should Architectures Care about Neuroscience? In P Tidwell (Ed.), *Architecture and Neuroscience* (pp. 42–76). Espoo: Tapio Wirkkala—Rut Bryk Foundation.

Aronson, E. (1995). *The Social Animal*. New York, NY: Freeman.

Arts & Humanities Research Council. (2017). GCRF Interdisciplinary Research Hubs. Retrieved December 6, 2018, from https://ahrc.ukri.org/funding/apply-for-funding/archived-opportunities/gcrf-interdisciplinary-research-hubs/

Ash, J. (2017). Visceral methodologies, bodily style and the non-human. *Geoforum*, **82**, 206–207.

Ashbullby, K. J., Pahl, S., Webley, P., & White, M. (2013). The beach as a setting for families' health promotion: A qualitative study with parents and children living in coastal regions in Southwest England. *Health & Place*, **23**, 138–147.

Aspinall, P., Mavros, P., Coyne, R., & Roe, J. (2013). The urban brain: analysing outdoor physical activity with mobile EEG. *British Journal of Sports Medicine*, **49**(4), 1–6.

Atia, N., & Davies, J. (2010). Nostalgia and the shapes of memory. *Memory Studies*, **3**, 181–186.

Atkins, P. (1989). The Architecture of Bournville 1879-1914. In *Made in Birmingham: 1889-1989* (pp. 35–48). Warwickshire: Brewin Books.

Babisch, W., Beule, B., Schust, M., Kersten, N., & Ising, H. (2005). Traffic noise and risk of myocardial infarction. *Epidemiology*, **16**(1), 33–40.

Bachelard, G. (1971). *The Poetics of Reverie*. Boston, MA: Beacon Press.

Bagnall, G. (2003). Performance and Performativity at Heritage Sites. *Museum and Society*, **1**(2), 87–103.

Bailey, A. R. (2002). *Constructing a Model Community: Institutions, Paternalism and Social Identities in Bournville, 1879-1939*. University of Birmingham.

Bailey, A. R., & Bryson, J. R. (2006). Stories of suburbia (Bournville, UK): from planning to people tales. *Social & Cultural Geography*, **7**(2), 179–198.

Bailey, A. R., & Bryson, J. R. (2007). A Quaker Experiment in Town Planning: George Cadbury and the Construction of Bournville Model Village. *Quaker Studies*, **11**(1), 89–114.

Bailey, C., White, C., & Pain, R. H. (1999). Evaluating qualitative research: dealing with the tension between "science" and "creativity." *Area*, **31**, 169–183.

Baillie, B. (2013). Conservation of the sacred at Angkor Wat: further reflections on living heritage. *Conservation and Management of Archaeological Sites*, **8**(3), 123–131.

Ballard, P. (1986). "Rus in Urbe": Joseph Chamberlain's Gardens at Highbury, Moor Green Birmingham, 1879-1914. *Garden History*, **14**(1), 61–76.

Ballard, P. (2009). *Highbury Park: Historic Landscape Appraisal*. Birmingham.

Bannerman, D. M., Rawlins, J. N. P., McHugh, S. B., Deacon, R. M. J., Yee, B. K., Bast, T., Zhang, W. N., Pothuizen, H. H. J. and Feldon, J., (2004). Regional dissociations within the hippocampus—memory and anxiety. *Neuroscience & Biobehavioral Reviews*, **28**(3), 273–283.

Barad, K. (2007). *Meeting the universe halfway: Quantum physics and the entanglement of matter and meaning*. Durham, NC: Duke University Press.

Barbara, A., & Perliss, A. (2006). *Invisible Architecture: Experiencing Places Through the Sense of Smell*. Milan: Skira.

Barlow, D. H. (2000). Unraveling the mysteries of anxiety and its disorders from the perspective of emotion theory. *American Psychologist*, **55**(11), 1247–1263.

Barr, D. A. (2015). Cognition, Behaviorm and Well-Being. In *Introduction to Biosocial Medicine: The Social, Psychological, and Biological Determinants of Human Behavior and Well-Being* (pp. 134–150). Baltimore, MD: John Hopkins University Press.

Barton, J., Hine, R., & Pretty, J. (2016). The health benefits of walking in greenspaces of high natural and heritage value. *Journal of Integrative Environmental Sciences*, **6**(4), 262–278.

Batcho, K. I. (2013). Nostalgia: The bittersweet history of a psychological concept. *History of Psychology*, **16**(3), 165–176.

Bayne, T. (2004). Closing the Gap? Some Questions for Neurophenomenology. *Phenomenology and the Cognitive Sciences*, **3**(4), 349–364.

Beaver, K. M., Nedelec, J. L., da Silva Costa, C., & Vidal, M. M. (2015). The future of biosocial criminology. *Criminal Justice Studies*, **28**(1), 6–17.

Beaver, K. M., & Walsh, A. (2011). Biosocial Criminology. In K. M. Beaver & A. Walsh (Eds.), *The Ashgate Research Companinion to Biosocial Theories of Crime* (pp. 3–16). Farnham: Ashgate Publishing Ltd.

Bekoff, M. (2010). *The emotional lives of animals: A leading scientist explores animal joy, sorrow, and empathy—and why they matter*. Novato, CA: New World Library.

Bell, S. L., Foley, R., Houghton, F., Maddrell, A., & Williams, A. (2018). From therapeutic landscapes to healthy spaces, places and practices: A scoping review. *Social Science & Medicine*, **196**, 123–130.

Bell, S. L., Phoenix, C., Lovell, R., & Wheeler, B. W. (2014). Green space, health and wellbeing: Making space for individual agency. *Health & Place*, **30**, 287–292.

Belle, L. (2018). Exploring Birmingham's heritage in the Jewellery Quarter. Retrieved September 7, 2018, from http://visitbirmingham.com/explore-birmingham/blog/exploring-birminghams-heritage-in-the-jewellery-quarter/

Ben-Ze'ev, A. (2000). What is an emotion? In *The Subtlety of Emotions* (pp. 13–48). Cambridge, MA: MIT Press.

Benjamin, W. (1999). *Illuminations*. London: Pimlico.

Bennett, J. (2009). *Vibrant Matter*. Durham, NC: Duke University Press.

Bennett, J., Cheah, P., Orlie, M. A., & Grosz, E. (2010). *New materialisms: Ontology, agency, and politics*. Durham, NC: Duke University Press.

Benning, S. D., & Ait Oumeziane, B. (2017). Reduced positive emotion and underarousal are uniquely associated with subclinical depression symptoms: Evidence from psychophysiology, self-report, and symptom clusters. *Psychophysiology*, **54**(7), 1010–1030.

Bergson, H. (1911). *Creative Evolution*. New York, NY: Henry Holt and Company.

Bergson, H. (2002). *Henri Bergson: Key writings*. (K. A. Pearson & John Ó Maoilearca, Eds.). London: Bloomsbury Publishing.

Bergson, H. (2004). *Matter and memory*. New York: Courier Corporation.

Bhatti, M., Church, A., Claremont, A., & Stenner, P. (2009). 'I love being in the garden': enchanting encounters in everyday life. *Social & Cultural Geography*, **10**(1), 61–76.

Bickerstaff, K. (2004). Risk perception research: socio-cultural perspectives on the public experience of air pollution. *Environment International*, **30**, 827–840.

Bickerstaff, K., & Walker, G. (2001). Public understandings of air pollution: the

'localisation' of environmental risk. *Global Enviornment Change*, *11*, 133–145.

Bille, M., Bjerregaard, P., & Sørensen, T. F. (2015). Staging Atmospheres. Materiality, Culture and the texture of the in-between. *Emotion, Space & Society*, **15**, 31–38.

Bilotta, E., & Evans, G. (2013). Environmental Stress. In L. Steg, A. E. Van Den Berg, & J. I. M. De Groot (Eds.), *Environmental Psychology: An Introduction* (pp. 27–35). London: Blackwell Publishing.

Bingham, J. (2015). Listed buildings at risk from cuts, warns heritage watchdog. Retrieved June 6, 2017, from http://www.telegraph.co.uk/news/uknews/12029774/Listed-buildings-at-risk-from-cuts-warns-heritage-watchdog.html

Birke, L. (2003). Shaping biology: feminism and the idea of 'the biological. In Simon Johnson Williams, L. Birke, & G. Bendelow (Eds.), *Debating biology: sociological reflections on health, medicine and society* (pp. 39–52). New York, NY: Taylor & Francis.

Birmingham City Council. (1992). *Conservation Strategy for Birmingham*. Birmingham: Birmingham City Council.

Birmingham City Council. (1994). Bournville Village Conservation Area Designation and Article 4(2) Designation Reports. Retrieved December 15, 2016, from https://www.birmingham.gov.uk/downloads/file/1264/bournville_village_conservation_area_designation_and_article_42_designation_reports

Birmingham City Council. (1999). *Regeneration through conservation: Birmingham Conservation Strategy*. Birmingham: Birmingham City Council.

Birmingham City Council. (2000). Conservation Area 17. Jewellery Quarter. Birmingham: Birmingham City Council.

Birmingham City Council. (2010). St Agnes Moseley Conservation Area Article 4 Direction. Birmingham: Birmingham City Council.

Birmingham City Council. (2016). Birmingham's Conservation Areas. Retrieved October 13, 2016, from https://www.birmingham.gov.uk/info/20055/conservation_areas/13/birminghams_conservation_areas

Birmingham City Council. (2017). St Agnes Conservation Area. Birmingham: Birmingham City Council. Retrieved from https://www.birmingham.gov.uk/download/downloads/id/914/st_agnes_moseley_conservation_area_leaflet.pdf

Birmingham City Council. (2018a). Historic Environmental Record. Retrieved May 14,

2018, from https://www.birmingham.gov.uk/info/20056/archaeology/49/historic_environment_record/1

Birmingham City Council. (2018b). What is a Conservation Area? Retrieved April 26, 2018, from https://www.birmingham.gov.uk/info/20055/conservation_areas/12/what_is_a_conservation_area

Birmingham City Council. (2018c). What is a statutory listed building? Retrieved July 12, 2018, from https://www.birmingham.gov.uk/info/20042/listed_buildings/39/what_is_a_statutory_listed_building

Birmingham City Council. (2019a). Conservations Area Review. Retrieved February 3, 2019, from https://www.birmingham.gov.uk/info/20030/conservation/1307/conservations_area_review

Birmingham City Council. (2019b). What is a Conservation Area? Retrieved January 29, 2019, from https://www.birmingham.gov.uk/info/20055/conservation_areas/12/what_is_a_conservation_area

Birmingham Jewellery Quarter. (2018). The Cemeteries in the Jewellery Quarter. Retrieved April 6, 2018, from https://www.birmingham-jewellery-quarter.net/about/the-cemeteries/

Birmingham Museums. (2014). *Birmingham's Heritage Strategy 2014-2019*. Birmingham: Birmingham City Council.

Birmingham Press. (2016). Record numbers visit Cadbury World. Retrieved June 20, 2018, from http://thebirminghampress.com/2016/01/record-numbers-visit-cadbury-world/

Birmingham Press. (2017). Record numbers visit Cadbury World. Retrieved June 20, 2018, from http://thebirminghampress.com/2017/01/record-numbers-visit-cadbury-world-2/

Bissell, D. (2008). Comfortable bodies: Sedentary affects. *Environment and Planning A*, **40**(7), 1697–1712.

Bissell, D. (2009). Travelling vulnerabilities: mobile timespaces of quiescence. *Cultural Geographies*, **16**(4), 427–445.

Bissell, D. (2010a). Narrating Mobile Methodologies: Active and Passive Empiricisms. In B. Fincham, M. McGuiness, & L. Murray (Eds.), *Mobile Methodologies* (pp. 53–68).

Basingstoke: Palgrave Macmillan.

Bissell, D. (2010b). Passenger mobilities: Affective atmospheres and the sociality of public transport. *Environment and Planning D: Society and Space*, **28**(2), 270–289.

Björk, E. A. (1986). Laboratory annoyance and skin conductance responses to some natural sounds. *Journal of Sound and Vibration*, **109**(2), 339–345.

Björk, E. A. (1995). Psychophysiological responses to some natural sounds. *Acta Acustica*, **3**(1), 83–88.

Blackswan. (2013). *Jewellery Quarter Property Market and Employment Study*. Birmingham.

Blesser, B., & Salter, L.-R. (2009). *Spaces Speak, Are You Listening?: Experiencing Aural Architecture*. Cambridge, MA: MIT Press.

Blunt, A. (2003). Collective memory and productive nostaglia: Anglo-Indian homemaking at McCluskieganj. *Environment and Planning D: Society and Space*, **23**, 717–738.

Blunt, A. (2005). *Domicile and Diaspora: Anglo-Indian women and the spatial politics of home*. London: Wiley-Blackwell.

Blunt, A., & Dowling, R. (2006). *Home*. London: Routledge.

Bolger, N., Davis, A., & Rafaeli, E. (2003). Diary methods: Capturing life as it is lived. *Annual Review of Psychology*, **54**(1), 579–616.

Bondi, L. (2005). Making connections and thinking through emotions: Between geography and psychotherapy. *Transactions of the Institute of British Geographers*, *30*, 433–448.

Bondi, L. (2014). Understanding feelings: Engaging with unconscious communication and embodied knowledge. *Emotion, Space and Society*, **10**(1), 44–54.

Bondi, L., & Davidson, J. (2011). Lost in translation: a response to Steve Pile. *Transactions of the Institute of British Geographers*, **36**(4), 595–598.

Bondi, L., Davidson, J., & Smith, M. (2007). Introduction: Geography's "Emotional Turn." In *Emotional Geographies* (pp. 1–18). Aldershot: Ashgate Publishing Ltd.

Bone, J. (2016). The nature of structure: a biosocial approach. *The Sociological Review Monographs*, **64**(1), 238–255.

Bonnett, A. (2016). *The Geography of Nostalgia: Global and Local Perspectives on Modernity and Loss*. New York: Routledge.

Bonnett, A., & Alexander, C. (2013). Mobile nostalgias: connecting visions of the urban past, present and future amongst ex-residents. *Transactions of the Institute of British Geographers*, **38**(3), 391–402.

Booth, R., Shutt, R., Harris, K., Williams, D., & Woodhouse, R. (2013). *Bournville Through*

Time. Stroud: Amberley.

Boschmann, E. E., & Cubbon, E. (2014). Sketch Maps and Qualitative GIS: Using Cartographies of Individual Spatial Narratives in Geographic Research. *The Professional Geographer*, **66**(2), 236–248.

Bourke, F. (2013). Birmingham is second rate says rest of UK as city comes bottom for accent, nightlife, architecture and culture. Retrieved November 23, 2016, from http://www.birminghammail.co.uk/news/local-news/birmingham-second-rate-says-rest-5374295

Bournville Parish Church. (2018). History. Retrieved April 18, 2018, from http://www.bournvilleparishchurch.org.uk/about/history

Bournville Village Trust. (2014). Stock's Wood: Site of Interest for Nature Conservation (SINC). Birmingham.

Bournville Village Trust. (2016). The Bournville Story. Retrieved November 7, 2016, from https://www.bvt.org.uk/our-business/the-bournville-story/

Bournville Village Trust. (2017a). Bournville's historic Village Green named one of the best in UK. Retrieved May 25, 2017, from https://www.bvt.org.uk/news-and-events/bournvilles-historic-village-green-named-one-of-the-best-in-uk/

Bournville Village Trust. (2017b). Selly Manor Museum. Retrieved August 9, 2017, from https://www.bvt.org.uk/our-communities/selly-manor-museum/

Bournville Village Trust. (2018). Bournville Estate Design Guide. Birmingham: Bournville Village Trust.

Bowler, D. E., Buyung-Ali, L., Knight, T. M., & Pullin, A. S. (2010a). Urban greening to cool towns and cities: A systematic review of the empirical evidence. *Landscape and Urban Planning*, **97**, 147–155.

Bowler, D. E., Buyung-Ali, L., Knight, T., & Pullin, A. S. (2010b). The importance of nature for health: Is there a specific benefit of contact with green space? *October*, **44**(0), 1–57.

Boym, S. (2001). *The Future of Nostalgia*. New York: Basic Books.

Bradley, M. M., & Lang, P. J. (2000). Measuring Emotion: Behavior, Feeling, and Physiology. In R. D. Lane & L. Nadel (Eds.), *Cognitive Neuroscience of Emotion* (pp. 242–276). Oxford: Oxford University Press.

Braidotti, R. (2013). *The Posthuman*. Cambridge, MA: Polity Press.

Brighenti, A. M., & Pavoni, A. (2019). City of Unpleasant Feelings. Stress, Comfort and Animosity in Urban Life. *Social & Cultural Geography*, **20**(2), 137–156.

Broadhead, R. S., & Rist, R. C. (1976). Gatekeepers and the social control of social research. *Social Problems*, **23**(3), 325–336.

Brown, K. M., Dilley, R., & Marshall, K. (2008). Using a head-mounted video camera to understand social worlds and experiences. *Sociological Research Online*, **13**(6).

Bruckner, H. K. (2018). Beyond happy meat: Body mapping (dis)connections to animals in alternative food neworks. *Area*, **50**, 322–330.

Brueckner, J. K., & Largey, A. G. (2008). Social interaction and urban sprawl. *Journal of Urban Economics*, **64**(1), 18–34.

Bruno, G. (2002). *Atlas of Emotion*. London: Verso.

Bryson, J. R., & Lowe, P. A. (1996). The Factory in the Garden: Bournville and a Hundred Years of Social Housing. In *Managing a Conurbation: Birmingham and its Region* (pp. 262–275). Warwickshire: Brewin Books.

Bryson, J. R., & Lowe, P. A. (2002). Story-telling and history construction: rereading George Cadbury's Bournville Model Village. *Journal of Historical Geography*, **28**(1), 21–41.

Bryson, J. R., & Lowe, P. A. (2005). The Role of William Alexander Harvey in the Construction of Bournville Model Village. *The Victorian*, **4**, 24–27.

Burmil, S., Daniel, T. C., & Hetherington, J. D. (1999). Human values and perceptions of water in arid landscapes. *Landscape and Urban Planning*, **44**(2–3), 99–109.

Butcher, S. (2012). Embodied cognitive geographies. *Progress in Human Geography*, **36**(1), 90–110.

Butler, J. (1993). *Bodies that Matter: On the Discursive Limits of Sex*. London; New York: Routledge.

Butler, J. (2002). *Gender Trouble*. London: Routledge.

Buttimer, A. (1976). Grasping the dynamism of lifeworld. *Annals of the Association of American Geographers*, **66**(2), 277–292.

Cacioppo, J. T., Berntson, G. G., Larsen, J. T., Poehlmann, K. M., & Ito, T. A. (2000). The psychophysiology of emotion. In M Lewis & J. M. Haviland (Eds.), *Handbook of Emotions* (pp. 173–191). New York, NY: Guildford Press.

Caffyn, A., & Lutz, J. (1999). Developing the heritage tourism product in multi-ethnic cities. *Tourism Management*, **20**(2), 213–221.

Cahill, L., & Alkire, M. T. (2003). Epinephrine enhancement of human memory consolidation: interaction with arousal at encoding. *Neurobiology of Learning and Memory*, **79**(2), 194–198.

Callard, F., & Fitzgerald, D. (2015). *Rethinking Interdisciplinarity across the Social Sciences and Neurosciences*. Basingstoke: Palgrave Macmillan.

Callard, F., Fitzgerald, D., & Woods, A. (2015). Interdisciplinary collaboration in action: Tracking the signal, tracing the noise. *Palgrave Communications*, **1**, 1–7. https://doi.org/10.1057/palcomms.2015.19

Calvo, R., & D'Mello, S. (2010). Affect detection: an interdisciplinary review of models, methods, and their applications. *IEEE Transactions on Affective Computing*, **1**(1), 18–37.

Carles, J. L., Barrio, I. L., & de Lucio, J. V. (1999). Sound influence on landscape values. *Landscape and Urban Planning*, **43**(4), 191–200.

Casey, E. (2001). Between geography and philosophy: what does it mean to be in the place-world? *Annals of the Association of American Geographers*, **91**(4), 683–693.

Castree, N., & MacMillan, T. (2004). Old news: representation and academic novelty. *Environment and Planning A*, **36**(1), 469–480.

Catani, M., Dell'Acqua, F., & De Schotten, M. T. (2013). A revised limbic system model for memory, emotion and behaviour. *Neuroscience & Biobehavioral Reviews*, **37**(8), 1724–1737.

Cattell, J., Ely, S., & Jones, B. (2002). *The Birmingham Jewellery Quarter: An Architectural Survey*. Swindon: English Heritage.

Cattell, V., Dines, N., Gesler, W. M., & Curtis, S. (2008). Mingling, observing, and lingering: Everyday public spaces and their implications for well-being and social relations. *Health & Place*, **14**, 544–561.

Chalfen, R. (2014). 'Your panopticon or mine?' Incorporating wearable technology's Glass and GoPro into visual social science. *Visual Studies*, **29**(3), 299–310.

Chalmers, D. J. (1996). *The Conscious Mind*. Oxford: Oxford University Press.

Charnley, S., & Durham, W. H. (2010). Anthropology and environmental policy: what counts? *American Anthropologist*, **112** (3), 397–415.

Chen, C.-F., & Chen, F.-S. (2010a). Experience quality, perceived value, satisfaction and behavioral intentions for heritage tourists. *Tourism Management*, **31**(1), 29–35.

Chen, C.-F., & Chen, P.-C. (2010b). Resident Attitudes toward Heritage Tourism Development. *Tourism Geographies*, **12**(4), 525–545.

Cherry, G. E. (1994). *Birmingham: A Study in Geography, History, and Planning*. New York: John Wiley & Sons.

Cherry, G. E. (1996). Bournville, England, 1895-1995. *Journal of Urban History*, **22**, 493–

508.

Cheung, W.-Y., Wildschut, T., Sedikides, C., Hepper, E. G., Arndt, J., & Vingerhoets, A. J. (2013). Back to the future: nostalgia increases optimism. *Personality & Social Psychology Bulletin*, **39**(11), 1484–1496.

Choudhury, S., & Slaby, J. (2011). *Critical neuroscience: a handbook of the social and cultural contexts of neuroscience*. John Wiley & Sons.

Cixous, H. (1976). Fiction and its phantoms: a reading of Freud's Das Unheimliche (The" uncanny"). *New Literary History*, **7**(3), 525–645.

Clark-Ibanez, M. (2004). Framing the Social World With Photo-Elicitation Interviews. *American Behavioral Scientist*, **47**(12), 1507–1527.

Clark, A. (1997). *Being There: Putting brain, body and world together again*. Cambridge, MA: MIT Press.

Clark, A. (2011). *Supersizing the mind: Embodiment, action, and cognitive extension*. Oxford: Oxford University Press.

Clark, C. D. (1999). The Autodriven interview: A photographic viewfinder into children's experience. *Visual Sociology*, **14**(1), 39–50.

Claßen, T., & Kistemann, T. (2010). Das Konzept der Therapeutischen Landschaften. *Geographische Rundschau*, **62**(7/8), 40–46.

Cloke, P., & Pawson, E. (2008). Memorial trees and treescape memories. *Environment and Planning D: Society and Space*, **26**(2), 107–122.

Coleman, T., & Kearns, R. A. (2015). The role of bluespaces in experiencing place, aging and wellbeing: Insights from Waiheke Island, New Zealand. *Health & Place*, **35**, 206–217.

Collins, D., & Kearns, R. A. (2007). Ambiguous landscapes: sun, risk and recreation on New Zealand beaches. In Allison Williams (Ed.), *Therapeutic Landscapes* (pp. 15–32). Aldershot: Ashgate Publishing Ltd.

Colombetti, G. (2014). *The Feeling Body: Affective Science Meets the Enactive Mind*. Cambridge, MA: MIT Press.

Connerton, P. (1989). *How societies remember*. New York: Cambridge University Press.

Connolly, W. E. (2002). *Neuropolitics: Thinking, culture, speed*. Minneapolis: University of Minnesota Press.

Conradson, D. (2005). Landscape, care and the relational self: Therapeutic encounters in rural England. *Health & Place*, **11**(4), 337–348.

Conradson, D. (2007). Freedom, Space and Perspective: Moving Encounters with Other

Ecologies. In J. Davidson, L. Bondi, & M. Smith (Eds.), *Emotional Geographies* (pp. 103–115). Aldershot: Ashgate Publishing Ltd.

Cook, D. I., & Van Haverbeke, D. F. (1974). *Tree-Covered Land-Forms For Noise Control*. Lincoln, NE.

Coole, D., & Frost, S. (2010). *New materialisms: Ontology, agency, and politics*. Durham, NC: Duke University Press.

Cope, M. (2010). Coding Transcipts and Diaries. In N. J. Clifford, S. French, & G. Valentine (Eds.), *Key Methods in Geography* (pp. 440–452). Los Angeles: SAGE.

Cope, M., & Elwood, S. (2009). *Qualitative GIS: A Mixed Methods Approach*. London: SAGE.

Cosgrove, D. (1983). Towards a Radical Cultural Geography: Problems of Theory. *Antipode*, **15**(1), 1–11.

Cosgrove, D., & Jackson, P. (1987). New Directions in Cultural Geography. *Area*, **19**, 95–101.

Coutts, A. M., Tapper, N. J., Beringer, J., Loughnan, M., & Demuzere, M. (2012). Watering our cities: The capacity for Water Sensitive Urban Design to support urban cooling and improve human thermal comfort in the Australian context. *Progress in Physical Geography*, **37**(1), 2–28.

Crampton, J. W. (2009). Cartography: performative, participatory, political. *Progress in Human Geography*, **33**(6), 840–848.

Crandall, B., Klein, G., & Hoffman, R. (2006). *Working Minds: a Practitioner's Guide to Cognitive Task Analysis*. Cambridge, MA: MIT Press.

Crang, M. (2003). Qualitative methods: touchy, feely, look-see? *Progress in Human Geography*, **27**(4), 494–504.

Crang, M. (2011). Virtual Life. In V. J. D. Casino, P. Thomas, P. Cloke, & R. Panelli (Eds.), *A companion to social geography* (pp. 401–416). Chichester: Wiley-Blackwell.

Crang, M., & Travlou, P. S. (2001). The city and topologies of memory. *Environment and Planning D: Society and Space*, **19**(2), 161–177.

Cresswell, T. (1999). Embodiment, power and the politics of mobility: The case of female tramps and hobos. *Transactions of the Institute of British Geographers*, **24**(2), 175–192.

Cresswell, T. (2004). *Place: A short introduction*. Oxford: Blackwell Publishing.

Cresswell, T. (2006). *On the move*. London: Taylor & Francis.

Creswell, J. W., & Clark, V. L. P. (2011). *Designing and Conducting Mixed Methods*

Research. London: SAGE.

Crinson, M. (2005). *Urban Memory: History and Amnesia in the Modern City*. Oxon: Routledge.

Cromby, J. (2007). Integrating Social Science with Neuroscience: Potentials and Problems. *BioSocieties*, *2*(2), 149–169.

Curry, M. (1994). Image, practice, and the unintended impact of geographical information systems. *Progress in Human Geography*, **18**, 441–459.

Curti, G. H., Aitken, S. C., Bosco, F. J., & Goerisch, D. D. (2011). For not limiting emotional and affectual geographies: A collective critique of Steve Pile's "Emotions and affect in recent human geography." *Transactions of the Institute of British Geographers*, **36**(4), 590–594.

Curtis, C. (1903, April). Highbury Gardens, Birmingham. *The Gardeners' Magazine*, 253–256.

Curtis, C. (1909, March). Some Birmingham Gardens. *The Gardeners' Magazine*, 201.

Dale, K. (2005). Building a Social Materiality: Spatial and Embodied Politics in Organizational Control. *Organization*, **12**(5), 649–678.

Dallimer, M., Irvine, K. N., Skinner, A. M. J., Davies, Z. G., Rouquette, J. R., Maltby, L. L., … Gaston, K. J. (2012). Biodiversity and the Feel-Good Factor : Understanding Associations between Self-Reported Human Well-being and Species Richness. *BioScience*, **62**(1), 47–55.

Damasio, A. (1999). *The Feeling of What Happens: Body and Emotion in the Making of Consciousness*. New York: Harcourt.

Darwin, C. (2004). Part III: Sexual Selection in relation to man, and conclusion. In J. Moore & A. Desmond (Eds.), *The Descent of Man, and Selection in Relation to Sex* (pp. 621–689). London: Penguin Books.

Darwin, C. (2009). *The Expression of Emotions on Man and Animals*. Cambridge: Cambridge University Press.

Davey, P. (1995). *Arts and Crafts Architecture*. Michigan: Phaidon.

Davidson, J., & Milligan, C. (2004). Embodying emotion sensing space: Introducing emotional geographies. *Social & Cultural Geography*, **5**(4), 523–532.

Davidson, J., Smith, M., & Bondi, L. (2007). *Emotional Geographies*. Aldershot: Ashgate Publishing Ltd.

Davidson, R. J. (2003). Affective neuroscience and psychophysiology: Toward a synthesis. *Psychophysiology*, **40**(5), 655–665.

Davidson, R. J., Scherer, K. R., & Goldsmith, H. H. (2003). Introduction. In *Handbook of Affective Sciences* (pp. xiii–xvii). Oxford: Oxford University Press.

Davies, G., & Dwyer, C. (2007). Qualitative methods and interpretative strategies: Are you enchanted or are you alienated? *Progress in Human Geography*, **31**(2), 257–266.

Davies, W.J., Adams, M.D., Bruce, N.S., Marselle, M., Cain, R., Jennings, P., Poxon, J., Carlyle, A., Cusack, P., Hall, D.A. and Irwin, A., (2007). The Positive Soundscape Project: A synthesis of results from many disciplines. In *9th International Congress on Acoustics*. Madrid.

Davis, F. (1979). *Yearning for Yesterday: A Sociology of Nostalgia*. New York, NY: Free Press.

Davis, M. (1997). Georg Simmel and Erving Goffman: Legitimators of the Sociological Investigation of Human Experience. *Qualitative Sociology*, **20**(3), 369–388.

Dawney, L. A. (2011). The motor of being: clarifying and defending the concept of affect. A response to Steve Pile's "Emotions and affect in recent human geography." *Transactions of the Institute of British Geographers*, **36**, 599–602.

DCMS. (2017). *Heritage Statement*. London.

de Bell, S., Graham, H., Jarvis, S., & White, P. (2017). The importance of nature in mediating social and psychological benefits associated with visits to freshwater blue space. *Landscape and Urban Planning*, **167**, 118–127.

De Fazio, K. (2011). Materialism, the Sensuous City, and the Material Analytics of Perception. In *The City of the Senses* (pp. 85–119). New York: Palgrave Macmillan.

de Freitas, E. (2018). The biosocial subject: sensor technologies and worldly sensibility. *Discourse: Studies in the Cultural Politics of Education*, **39**(2), 292–308.

De Propris, L., & Wei, P. (2007). Governance and Competitiveness in the Birmingham Jewellery District. *Urban Studies*, **44**(12), 2465–2486.

Degen, M. M. (2008). Sensuous Power. In *Sensing Cities: Regenerating public life in Barcelona and Manchester* (pp. 54–73). New York: Routledge.

Degen, M. M., DeSilvey, C., & Rose, G. (2008). Experiencing visualities in designed urban environments: learning from Milton Keynes. *Environment and Planning A*, **40**, 1901–1920.

Degen, M. M., & Rose, G. (2012). The sensory experiencing of urban design: the role of walking and perceptual memory. *Urban Studies*, **49**(15), 3271–3287.

Del Casino, V. J., & Hanna, S. P. (2006). Beyond the "binaries": A methodological intervention for interrogating maps as representational practices. *ACME*, **4**(1), 34–56.

Deleuze, G. (1988). *Spinoza, practical philosophy*. *City*.

Deleuze, G. (1994). *Difference and Repetition*. New York: Columbia University Press.

Deleuze, G. (1997). Spinoza and the three ethics. In W. Montag & T. Stolze (Eds.), *The New Spinoza* (pp. 21–36). Minneapolis: University of Minnesota Press.

Deleuze, G., & Guattari, F. (1987). *A Thousand Plateaus: Captialism and Schizophrenia*. London: Athlone Press.

DeLyser, D. (1999). Authenticity on the ground: Engaging the past in a California ghost town. *Annals of the Association of American Geographers*, **89**(4), 602–632.

Demeritt, D. (1994). The nature of metaphors in cultural geography and environmental history. *Progress in Human Geography*, **18**(2), 163–185.

Dempsey, N. P. (2010). Stimulated recall interviews in ethnography. *Qualitative Sociology*, **33**(3), 349–367.

Dennis, S. (2006). Prospects for qualitative GIS at the intersection of youth development and participatory urban planning. *Environment and Planning A*, **38**(11), 2039–2054.

Department for Environment Food & Rural Affairs. (2015). Open data: strategic noise mapping. Retrieved February 14, 2018, from https://www.gov.uk/government/publications/open-data-strategic-noise-mapping

Derrida, J. (1972). *Positions*. Chicago, IL: University of Chicago Press.

DeSilvey, C. (2010). Memory in motion: soundings from Milltown, Montana. *Social & Cultural Geography*, **11**(5), 491–510.

DeSilvey, C. (2012). Copper places: affective circuitries. In O. Jones & J. Garde-Hansen (Eds.), *Geography and Memory: Explorations in Identity, Place and Becoming* (pp. 45–57). Basingstoke: Palgrave Macmillan.

DeSilvey, C., & Edensor, T. (2012). Reckoning with ruins. *Progress in Human Geography*, **37**(4), 465–485.

Dewsbury, J.-D. (2000). Performativity and the event: enacting a philosophy of difference. *Environment and Planning D: Society and Space*, **18**(4), 473–496.

Dewsbury, J.-D. (2003). Witnessing space: "knowledge without contemplation." *Environment and Planning A*, **35**, 1907–1932.

Dewsbury, J.-D. (2016). Language and the event: The unthought of appearing worlds. In B. Anderson & P. Harrison (Eds.), *Taking-place: non-representational theories and geography*. (pp. 161–174). London: Routledge.

Dewsbury, J.-D., & Cloke, P. (2009). Spiritual Landscapes: Existence Performance and Immanence. *Social & Cultural Geography*, **10**(6), 695–771.

Dewsbury, J.-D., Harrison, P., Rose, M., & Wylie, J. (2002). Enacting geographies. *Geoforum*, **33**(4), 437–440.

Dey, I. (1993). *Qualitative Data Analysis: A User-Friendly Guide for Social Scientist*. London: Routledge.

Dickerson, S. S., Gruenewald, T. L., & Kemeny, M. E. (2009). Psychobiological responses to social self threat: Functional or detrimental? *Self and Identity*, **8**(2–3), 270–285.

Dorfman, B. (2010). Cadbury deal near end, Kraft CEO sees sleep. Retrieved August 1, 2017, from https://www.reuters.com/article/us-cadbury-kraft-interview-idUSTRE6114X620100202

Doshi, S. (2013). Resettlement ecologies: environmental subjectivity and graduated citizenship in Mumbai. In A. Rademacher & K. Sivaramakrishnan (Eds.), *Ecologies of Urbanism in India: metropolitan civility and sustainability* (pp. 225–248). Hong Kong: Hong Kong University Press.

Dover, J. W. (2015). Benefits of green infrastructure. In *Green Infrastructure: Incorporating Plants and Enhancing Biodiversity in Buildings and Urban Environments* (pp. 7–64). Abingdon: Routledge.

Downs, R. M., Liben, L. S., & Daggs, D. G. (1988). On education and geographers: the role of cognitive-development theory in geographic education. *Annals of the Association of American Geographers*, **78**(4), 680–700.

Downs, R. M., & Stea, D. (1973). *Image and Environment: Cognitive Mapping and Spatial Behavior*. Piscataway, NJ: Transaction Publishers.

Downs, R. M., & Stea, D. (1977). *Maps in minds: Reflections on cognitive mapping*. New York, NY: HarperCollins Publishers.

Drachen, A., Nacke, L. E., Yannakakis, G., & Pedersen, A. L. (2010). Correlation between heart rate, electrodermal activity and player experience in first-person shooter games. In *Proceedings of the 5th ACM SIGGRAPH Symposium on Video Games* (pp. 49–54). ACM.

Draganski, B., Gaser, C., Busch, V., Schuierer, G., Bogdahn, U., & May, A. (2004). Neuroplasticity: changes in grey matter induced by training. *Nature*, **427**(6972), 311.

Dreher, M. (1994). Qualitative research methods from the reviewer's perspective. In J. M. Morse (Ed.), *Critical Issues in Qualitative Methods* (pp. 281–297). Thousand Oaks, CA: SAGE.

Drobnick, Jim. (2002). Toposmia: Art, scent, and interrogations of spatiality. *Angelaki: Journal of Theoretical Humanities*, **7**(1), 31–47.

Duff, C. (2010). On the role of affect and practice in the production of place. *Environment and Planning. D, Society and Space*, **28**(5), 881–895.

Duff, C. (2016). Atmospheres of recovery: Assemblages of health. *Environment and Planning A*, **48**(1), 58–74.

Dunkley, C. M. (2009). A therapeutic taskscape: theorizing place-making, discipline and care at a camp for troubled youth. *Health & Place*, **15**, 88–96.

Dwyer, O. J., & Alderman, D. H. (2008). Memorial landscapes: analytic questions and metaphors. *GeoJournal*, **73**(3), 165–178.

Dyckhoff, T. (2013). Let's move to: Moseley, Birmingham. Retrieved August 4, 2017, from https://www.theguardian.com/money/2013/nov/29/lets-move-moseley-birmingham-property

Eckstein, M. K., Guerra-Carrillo, B., Singley, A. T. M., & Bunge, S. A. (2017). Beyond eye gaze: What else can eyetracking reveal about cogniton and cognitive development? *Developmental Cognitive Neuroscience*, **25**, 69–91.

Economic & Social Research Council. (2014). ESRC Framework to Enable Biosocial Research.

Economic & Social Research Council. (2016). Research Ethics. Retrieved April 23, 2016, from http://www.esrc.ac.uk/funding/guidance-for-applicants/research-ethics/

Edensor, T. (2005a). *Industrial Ruins: Spaces, Aesthetics and Materiality*. Oxford: Berg.

Edensor, T. (2005b). The ghosts of industrial ruins: Ordering and disordering memory in excessive space. *Environment and Planning D: Society and Space*, **23**(6), 829–849.

Edensor, T. (2007). Sensing the ruin. *The Senses and Society*, **2**(2), 217–232.

Edensor, T. (2008). Walking through ruins. In T. Ingold & J. Vergunst (Eds.), *Ways of Walking: Ethnography and Practice on Foot* (pp. 123–142). Aldershot: Ashgate Publishing Ltd.

Edensor, T. (2012). Illuminated atmospheres: Anticipating and reproducing the flow of affective experience in Blackpool. *Environment and Planning D: Society and Space*, **30**(1), 1103–1122.

Edensor, T. (2014). Producing atmospheres at the match: Fan cultures, commercialisation and mood management in English football. *Emotion, Space and Society*, **15**, 1–8.

Edensor, T. (2018). Creative engagements with the past, aesthetics and matter in ruined space. In G. Heeney (Ed.), *The Post-Industrial Landscape as Site for Creative Practice: Material Memory* (pp. 17–26). Cambridge: Cambridge Scholars Publishing.

Ekman, P. (1972). Universal and Cultural Differences in Facial Expressions of Emotion. In

J. . Cole (Ed.), *Nebraska Symposium on Motivation* (pp. 207–283). Lincoln, NE: University of Nebraska Press.

Ekman, P. (1992). An argument for basic emotions. *Cognition & Emotion*, **6**(3), 169–200.

Elden, S. (2004). *Understanding Lefebvre: Theory and the Possible*. London: Continuum.

Elkes, N. (2018). £8m plan to return Highbury Hall to the glory days of the Chamberlains.

Ellard, C. (2015). *Places of the heart: the psychogeography of everyday life*. New York: Bellevue Literary Press.

Elwood, S., & Mitchell, K. (2012). Mapping children's politics: spatial stories, dialogic relations and political formation. *Geografiska Annaler: Series B, Human Geography*, **94**(1), 1–15.

Emery, J. (2018). Belonging, memory and history in the north Nottinghamshire coalfield. *Journal of Historical Geography*, **59**, 77–89.

Emmanielli, X., & Malabou, C. (2009). *La grande exclusion : L'urgence sociale, symptôme et thérapeutique*. Paris: Bayard Press.

Empatica. (2014). Empatica E4 Technical Specifications. Retrieved May 11, 2017, from http://box.empatica.com/documentation/20141119_E4_TechSpecs.pdf

Empatica. (2016). E4 Wristband. Retrieved May 4, 2016, from https://www.empatica.com/e4-wristband

Erickson, K. I., Voss, M. W., Prakash, R. S., Basak, C., Szabo, A., Chaddock, L., Kim, J. S., Heo, S., Alves, H., White, S. M. and Wojcicki, T. R. (2011). Exercise training increases size of hippocampus and improves memory. *Proceedings of the National Academy of Sciences*, **108**(7), 3017–3022.

Eshel, A. (2010). Layered Time: Ruins as Shattered Past, Ruins as Hope in Israeli and German Landscapes and Literature. In J. Hell & A. Schönle (Eds.), *Ruins of Modernity* (pp. 133–150). Durham, NC: Duke University Press.

European Commission. (1996). *Future Noise Policy*. Brussels.

Evans, G., & Wener, R. E. (2007). Crowding and personal space invasion on the train: Please don't make me sit in the middle. *Journal of Environmental Psychology*, **27**(1), 90–94.

Evans, J., & Jones, P. (2011). The walking interview: Methodology, mobility and place. *Applied Geography*, **31**(2), 849–858.

Everly Jr., G., & Rosenfield, R. (1981). *The Nature and Treatment of the Stress Response: A Practical Guide for Clinicians*. New York: Springer.

Evers, C. (2015). Researching Action Sport with a GoPro™ Camera: An Embodied and Emotional Mobile Video Tale of the Sea, Masculinity, and Men-who-Surf. In I.

Wellard (Ed.), *Researching Embodied Sport: Exploring Movement Cultures* (pp. 145–162). London: Routledge.

Extrium. (2012). England Noise Map Viewer. Retrieved January 23, 2018, from http://www.extrium.co.uk/noiseviewer.html

Eyles, J., & Litva, A. (1998). Place, participation and policy: people in and for health care policy. In R. A. Kearns & W. M. Gesler (Eds.), *Putting Health into Place: Landscape, Identity and Well-being* (pp. 248–269). Syracuse, NY: Syracuse University Press.

Faimberg, H. (2005). *The Telescoping of Generations: Listening to the Narcissistic Links between Generations*. Abingdon: Psychology Press.

Faimberg, H. (2007). A plea for a broader concept of Nachträglichkeit. *Psychoanalytic Quarterly*, **76**(4), 1221–1240.

Fairley, S., & Gammon, S. (2005). Something Lived, Something Learned: Nostalgia's Expanding Role in Sport Tourism. *Sport in Society*, **8**(2), 182–197.

Fairn, A. (2004). *A History of Moseley*. Birmingham: 600 Celebrations Commitee.

Fang, C.-F., & Ling, D.-L. (2005). Guidance for noise reduction provided by tree belts. *Landscape and Urban Planning*, **71**(1), 29–34.

Feierman, J. R. (2012). *Pedophilia: biosocial dimensions*. New York, NY: Springer-Verlag.

Feldman-Barrett, L. (2006). Are emotions natural kinds? *Perspectives on Psychological Science*, **1**, 28–58.

Feldman-Barrett, L., Mesquita, B., Ochsner, K. N., & Gross, J. J. (2007). The Experience of Emotion. *Annual Review of Psychology*, **58**, 373–403.

Feldman, M. S., Bell, J., & Berger, M. T. (2003). *Gaining access: A practical and theoretical guide for qualitative researchers*. Walnut Creek, CA: Altamira Press.

Fernandez, D., & Wilkins, A. J. (2008). Uncomfortable images in art and nature. *Perception*, **37**(7), 1098–1113.

Fiallo, E. A., & Jacobson, S. K. (1995). Local Communities and Protected Areas: Attitudes of Rural Residents Towards Conservation and Machalilla National Park, Ecuador. *Environmental Conservation*, **22**(3), 241–249.

Fitzgerald, D. (2017). *Tracing autism: uncertainty, ambiguity, and the affective labor of neuroscience*. Seattle, WA: University of Washington Press.

Fitzgerald, D., & Callard, F. (2015). Social Science and Neuroscience beyond Interdisciplinarity: Experimental Entanglements. *Theory, Culture & Society*, **32**(1), 3–32.

Fitzgerald, D., Rose, N., & Singh, I. (2016). Living well in the Neuropolis. *The Sociological*

Review, **64**(1), 221–237.

Foley, R. (2011). Performing health in place: the holy well as a therapeutic assemblage. *Health & Place*, **17**(2), 470–479.

Forest, B., & Johnson, J. (2002). Unraveling the threads of history: soviet–era monuments and post–soviet national identity in Moscow. *Annals of the Association of American Geographers*, **92**(3), 524–547.

Foster, A. (2005). *Birmingham*. New Haven, Connecticut: Yale University Press.

Fox, N. J., & Alldred, P. (2014). New materialist social inquiry: designs, methods and the research-assemblage. *International Journal of Social Research Methodology*, **18**(4), 399–414.

Frankenhuis, W. E., Panchanathan, K., & Nettle, D. (2016). Cognition in harsh and unpredictable environments. *Current Opinion in Psychology*, **7**, 76–80.

Frankish, T., & Bradbury, J. (2012). Telling stories for the next generation: Trauma and nostalgia. *Peace and Conflict: Journal of Peace Psychology*, *18*(3), 294.

Franks, D. D. (2010). *Neurosociology: The nexus between neuroscience and social psychology*. Berlin: Springer.

Fredrickson, B. L., & Levenson, R. W. (1998). Positive Emotions Speed Recovery from the Cardiovascular Sequelae of Negative Emotions. *Cognition and Emotion*, **12**(2), 191–220.

French, S., Wood, L., Foster, S. A., Giles-Corti, B., Frank, L., & Learnihan, V. (2014). Sense of community and its association with the neighborhood built environment. *Environmental and Behavior*, **46**(6), 677–697.

Freud, A. (1992). *The Ego and the Mechanisms of Defence*. London: Karnac Books.

Freud, S. (1991). The Ego and the Id. In A. Richards (Ed.), *On Metapsychology: The Theory of Psychoanalysis (Vol. 11)* (pp. 339–408). London: Penguin UK.

Freud, S. (2003a). *Beyond the pleasure principle: and other writings*. Penguin UK.

Freud, S. (2003b). *The Uncanny*. London: Penguin.

Frijda, N. H. (1986). *The Emotions*. Cambridge: Cambridge University Press.

Fritzsche, P. (2002). How nostalgia narrates modernity. In P. Fritzsche & A. Confino (Eds.), *The Work of Memory: New Directions in the Study of German Society and Culture* (pp. 62–85). Champaign: University of Illinois Press.

Frost, S. (2016). *Biocultural creatures: Toward a new theory of the human*. Durham, NC: Duke University Press.

Gagen, E. A. (2015). Governing emotions: Citizenship, neuroscience and the education of

youth. *Transactions of the Institute of British Geographers*, **40**(1), 140–152.

Gallagher, S. (2006). *How the Body Shapes the Mind*. Oxford: Clarendon Press.

Gallese, V., & Goldman, A. (1998). Mirror neurons and the simulation theory of mind-reading. *Trends in Cognitive Sciences*, **2**(12), 493–501.

Garbarino, M., Lai, M., Bender, D., Picard, R. W., & Tognetti, S. (2014). Empatica E3 - A wearable wireless multi-sensor device for real-time computerized biofeedback and data acquisition. In *EAI 4th International Conference on Wireless Mobile Communication and Healthcare (Mobihealth)* (pp. 39–42).

Gardiner, M. (2004). Everyday utopianism: Lefebvre and his critics. *Cultural Studies*, **18**(2–3), 228–254.

Garrett, B. L. (2011a). Assaying history: creating temporal junctions through urban exploration. *Environment and Planning D: Society and Space*, **29**(6), 1048–1067.

Garrett, B. L. (2011b). Videographic geographies: Using digital video for geographic research. *Progress in Human Geography*, **35**(4), 521–541.

Garrett, B. L. (2012). *Place Hacking: Tales of Urban Exploration*. Royal Holloway.

Gattens, M. (1988). Towards a feminist philosophy of the body. In B. Caine, E. Grosz, & M. De Lepervanche (Eds.), *Crossing Boundaries: feminisms and critiques of knowledges* (pp. 59–70). Sydney: Allen and Unwin.

Gattrell, A. C. (2013). Therapeutic mobilities: walking and 'steps' to wellbeing and health. *Health & Place*, **22**, 98–106.

Geertz, C. (1996). The Interpretation of Cultures: Selected Essays. *Contemporary Sociology*, **25**(3), 299.

Gentile, J. (2014). On Mattering, Materiality, and "Transitional Memory": A Discussion of Jonathan H. Slavin's Essay. *Psychoanalytic Perspectives*, **11**(1), 35–43.

Gesler, W. M. (1991). *The Cultural Geography of Health Care*. Pittsburgh, PA: University of Pittsburgh Press.

Gesler, W. M. (1992). Therapeutic landscapes: Medical issues in light of the new cultural geography. *Social Science and Medicine*, **34**(7), 735–746.

Gesler, W. M. (1993). Therapeutic Landscapes: theory and a case study of Epidauros, Greece. *Environment and Planning D: Society and Space*, **11**(2), 171–189.

Gesler, W. M. (1996). Lourdes: healing in a place of pilgramage. *Health & Place*, **2**(2), 95–105.

Gesler, W. M. (1998). Bath's reputation as a healing place. In R. A. Kearns & W. M. Gesler (Eds.), *Putting health into place: Landscape, identity, and well-being* (pp. 17–35).

Syracuse, NY: Syracuse University Press.

Gesler, W. M. (2003). *Healing Places*. Lanham: Rowman & Littlefield Publishers.

Gesler, W. M., & Curtis, S. (2007). Application of Concepts of Therapeutic Landscapes to the Design of Hospitals in the UK: The Example of a Mental Health Facility in London. In Allison Williams (Ed.), *Therapeutic Landscapes* (pp. 149–164). Aldershot: Ashgate Publishing Ltd.

Getz, D. A., Karow, A., & Kielbaso, J. J. (1982). Inner city preferences for trees and urban forestry programs. *Journal of Arboriculture*, **8**(10), 258–263.

Giddens, A. (1982). Hermenutics and social theory. In A. Giddens (Ed.), *Profiles and critiques in social theory* (pp. 1–17). Berkeley, CA: University of California Press.

Gidlof-Gunnarsson, A., & Öhrström, E. (2007). Noise and well-being in urban residential environments: The potential role of perceived availability to nearby green areas. *Landscape and Urban Planning*, **83**, 115–126.

Wang, R., Blackburn, G., Desai, M., Phelan, D., Gillinov, L., Houghtaling, P. & Gillinov, M. (2017). Accuracy of Wrist-Worn Heart Rate Monitors. *JAMA Cardiology*, **2**(1), 104–106.

Glass, D., & Singer, J. (1972). *Urban Stress*. New York: Academic Press.

Gold, I., & Stoljar, D. (1999). A neuron doctrine in the philosophy of neuroscience. *Behavioural and Brain Science*, **22**(5), 809–830.

Goldie, P. (2000). *The Emotions: A Philosophical Exploration*. Oxford: Oxford University Press.

Goldstein, D. S., & Kopin, I. J. (2007). Evolution of concepts of stress. *Stress*, **10**(2), 109–120.

Golledge, R. G. (1997). *Spatial behavior: A geographic perspective*. New York: Guilford Press.

Golledge, R. G. (1999). *Wayfinding Behavior: Cognitive Mapping and Other Spatial Processes*. Baltimore, MD: John Hopkins University Press.

Graham, B. (2002). Heritage as knowledge: capital or culture? *Urban Studies*, **39**(5–6), 1003–1017.

Graham, B., Ashworth, G. J., & Tunbridge, J. E. (2016). *A Geography of Heritage*. London: Routledge.

Gregory, D. (1994). Geography and the Cartographic Anxiety. In *Geographical Imaginations* (pp. 70–208). Oxford: Blackwell Publishing.

Gregory, D., Johnston, R., Pratt, G., Watts, M., & Whatmore, S. (2011). *The Dictionary of*

Human Geography. New York: John Wiley & Sons.

Grosz, E. (1990). Conclusion: A note on essentialism and difference. In S. M. Gunew (Ed.), *Feminist Knowledge, Critique and Construct* (pp. 332–344). London; New York: Routledge.

Grosz, E. (1994). *Volatile Bodies: Towards Corporeal Feminism*. Bloomington, IN: Indiana University Press.

Gupta, A. (2002). Reliving Childhood? The Temporality of Childhood and Narratives of Reincarnation. *Ethnos*, **67**(1), 33–55.

Halbwachs, M. (1992). *On Collective Memory*. Chicago, IL: University of Chicago Press.

Halcomb, E. J., & Davidson, P. M. (2006). Is verbatim transcription of interview data always necessary? *Applied Nursing Research*, **19**(1), 38–42.

Hall, E. (2000). "Blood, brain and bones": taking the body seriously in the geography of health and impairment. *Area*, **32**(1), 21–29.

Hancock, B. H., & Garner, R. (2014). Reflections on the ruins of Athens and Rome: Derrida and Simmel on temporality, life and death. *History of the Human Sciences*, **27**(4), 77–97.

Handler, R. (1984). Review: The Invention of Tradition by Eric Hobsbawm; Terence Ranger. *American Anthropologist*, **86**(4), 1025–1026.

Hannah, M. G. (2013). Attention and the Phenomenological Politics of Landscape. *Geografiska Annaler: Series B, Human Geography*, **95**(3), 235–250.

Haraway, D. (1988). Situated Knowledges: The Science Question in Feminism and the Privilege of Partial Perspective. *Feminist Studies*, **14**(3), 575–599.

Haraway, D. (1991). A cyborg manifesto: science, technology, and socialist-feminism in the late twentieth century. In *Simians, Cyborgs and Women: The Reinvention of Nature* (pp. 149–182). London: Routledge.

Haraway, D. (1997). *Modest−Witness@Second−Millennium.FemaleMan−Meets−OncoMouse: Feminism and Technoscience*. London; New York: Routledge.

Haraway, D. (2013). *When species meet*. Minneapolis, MN: University of Minnesota Press.

Hariri, A. R., Bookheimer, S. Y., & Mazziotta, J. C. (2000). Modulating emotional responses: effects of a neocortical network on the limbic system. *Neuroreport*, **11**(1), 43–48.

Harley, B. (1992). Deconstructing the map. In T. Barnes & J. Duncan (Eds.), *Writing Worlds: Discourse, Text and Metphor in the Representation of Landscape* (pp. 231–

247). London: Routledge.

Harris, P. (2017). Nostalgia and play. In W. Russell, H. Smith, & S. Lester (Eds.), *Practice-based Research in Children's Play* (pp. 19–34). Bristol: Policy Press.

Harrowell, E. (2015). *From monuments to mahallas: constrasting memories in the urban landscape of Osh, Kyrgyzstan*. PhD Thesis: University of Birmingham.

Harrowell, E., Davies, T., & Disney, T. (2017). Making Space for Failure in Geographic Research. *Professional Geographer*. **70**(2), 230-238.

Harvey, D. C. (2001). Heritage pasts and heritage presents: temporality, meaning and the scope of heritage studies. *International Journal of Heritage Studies*, **7**(4), 319–338.

Harvey, D. C. (2015). Landscape and Heritage: Trajectories and consequences. *Landscape Research*, **40**(8), 911–924.

Harvey, W. A. (1906). *The Model Village and its Cottages: Bournville*. London: Batsford.

Haughton, H. (2003). The Uncanny 1919. In S. Freud (Ed.), *The Uncanny*. London: Penguin.

Hayes-Conroy, A. (2009). *Bodily Geographies of "Slow" Food: Food activism and visceral politics*. PhD Thesis: Clark University.

Hayes-Conroy, A. (2017). Critical visceral methods and methodologies: Debate title: Better than text? Critical reflections on the practices of visceral methodologies in human geography. *Geoforum*, **82**, 51–52.

Hayes-Conroy, A., & Hayes-Conroy, J. (2008). Taking back taste: Feminism, food and visceral politics. *Emotion, Place and Culture*, **15**, 461–473.

Hayes-Conroy, A., & Martin, D. (2010). Mobilising bodies: visceral identification in the Slow Food movement. *Transactions of the Institute of British Geographers*, **35**, 269–281.

Hayes-Conroy, J., & Hayes-Conroy, A. (2013). Veggies and visceralities: A political ecology of food and feeling. *Emotion, Place and Culture*, **6**, 81–90.

Hebbert, M. (2005). The Street as Locus of Collective Memory. *Environment and Planning D: Society and Space*, **23**, 581–596.

Heidegger, M. (1996). *Being and Time*. New York, NY: State University of New York Press.

Heidenreich, M., & Plaza, B. (2015). Renewal through culture? The role of museums in the renewal of industrial regions in Europe. *European Planning Studies*, **23**(8), 1441–1455.

Hell, J., & Schönle, A. (2010). *Ruins of Modernity*. Durham: Duke University Press.

Hellhammer, D. H., Wüst, S., & Kudielka, B. M. (2009). Salivary cortisol as a biomarker in stress research. *Psychoneuroendocrinology*, **34**, 163–171.

Henry, S. G., & Fetters, M. D. (2012). Research Method for Investigating Physician-Patient

Interactions. *Annals of Family Medicine*, **10**(2), 118–126.

Henshaw, V. (2013). *Urban Smellscapes: Understanding and Designing City Smell Environments*. Abingdon: Routledge.

Hernández, B., Hidalgo, M. C., Salazar-Laplace, M. E., & Hess, S. (2007). Place attachment and place identity in natives and non-natives. *Journal of Environmental Psychology*, **27**(4), 310–319.

Hernes, T. (2004). *The Spatial Construction of Organisation*. Amsterdam: John Benjamins Press.

Hertz, D. G. (1989). Trauma and nostalgia: new aspects on the coping of aging Holocaust survivors. *Israel Journal of Psychiatry and Related Sciences*, **27**(4), 189–198.

Herz, R. (2006). I Know What I Like - Understanding Odor Preferences. In J Drobnick (Ed.), *The Smell Culture Reader* (pp. 75–94). Oxford: Berg.

Herz, S., & Schooler, J. W. (2002). A naturalistic study of autobiographical memories evoked by olfactory and visual cues: testing the Proustian hypothesis. *American Journal of Psychology*, **115**(1), 21–32.

Herzog, T. R. (1985). A cognitive analysis of preference for waterscapes. *Journal of Environmental Psychology*, **5**(3), 225–241.

Higgins, J. (2018). Biosocial selfhood: overcoming the 'body-social problem' within the individuation of the human self. *Phenomenology and the Cognitive Sciences*, **17**(3), 433–454.

Highbury Park Friends. (2012). Discover Highbury Park. Retrieved February 15, 2018, from http://highburyparkfriends.org.uk/text/reports/Highbury Park Discovery Trail pdf.pdf

Highbury Park Friends. (2018). History. Retrieved May 6, 2018, from http://highburyparkfriends.org.uk/wp/about-highbury-park/history/

Hill, L. (2013). Archaeologies and geographies of the post-industrial past: Landscape, memory and the spectral. *Cultural Geographies*, **20**, 379–396.

Hillman, J. (1994). *The Bournville Hallmark*. Studley: Brewin Books.

Historic England. (2018). Highbury Hall. Retrieved May 8, 2018, from https://historicengland.org.uk/listing/the-list/list-entry/1001203

History West Midlands. (2018). *Making Highbury Bloom Again*. UK: History West Midlands. Retrieved from https://historywm.com/films/making-highbury-bloom-again

Hobsbawn, E., & Ranger, T. (2012). *The Invention of Tradition*. New York: Cambridge University Press.

Hodder, M. (2016). Before Beorma: Prehistoric and Roman Birmingham. In C. Chinn & M.

Dick (Eds.), *Birmingham, the workshop of the world* (pp. 51–71). Liverpool: Liverpool University Press.

Hoelscher, S., & Alderman, D. H. (2004). Memory and place: geographies of a critical relationship. *Social & Cultural Geography*, **5**(3), 347–355.

Hoffman, B. T. (2006). *Art and Cultural Heritage: Law, Policy and Practice*. Cambridge: Cambridge University Press.

Hoffman, M. L. (2008). Empathy and prosocial behavior. In Michael Lewis, J. M. Haviland-Jones, & L. Feldman Barrett (Eds.), *Handbook of Emotions* (Third, pp. 440–455). New York: Guildford Press.

Holt, R. (1986). *The early history of the town of Birmingham, 1166–1600,*. Oxford: Dugdale Society.

Holyoak, J. (2010). Birmingham: Translating Ambition into Quality. In J. Punter (Ed.), *Urban Design and the British Urban Renaissance* (pp. 35–50). Abbington: Routledge.

Holyoak, J. (2016a). A golden development in the Jewellery Quarter. Retrieved August 11, 2017, from http://www.birminghampost.co.uk/business/commercial-property/golden-development-jewellery-quarter-9276682

Holyoak, J. (2016b). Birmingham's conservation areas only work if residents are on side. Retrieved June 8, 2017, from http://www.birminghampost.co.uk/news/news-opinion/birminghams-conservation-areas-only-work-11794577

Hölzel, B. K., Carmody, J., Evans, K. C., Hoge, E. A., Dusek, J. A., Morgan, L., … Lazar, S. W. (2010). Stress reduction correlates with structural changes in the amygdala. *Social Cognitive and Affective Neuroscience*, **5**(1), 11–17.

Hooke, D. (1988). Early Forms of Open-Field Agriculture in England. *Geografiska Annaler: Series B, Human Geography*, **70**(1), 123–131.

Horlick-Jones, T., Sime, J., & Pidgeon, N. (2003). The social dynamics of environmental risk perception: implications for risk communication research and practice. In N. Pidgeon, R. E. Kasperson, & P. Slovic (Eds.), *The Social Amplification of Risk* (pp. 262–285). Cambridge: Cambridge University Press.

Horton, J., & Kraftl, P. (2006). Not just growing up, but going on: Materials, Spacings, Bodies, Situations. *Children's Geographies*, **4**(3), 259–276.

Horton, J., & Kraftl, P. (2012). Clearing out a cupboard: memory, materiality and transitions. In O. Jones & J. Garde-Hansen (Eds.), *Geography and Memory: Explorations in Identity, Place and Becoming* (pp. 25–44). Basingstoke: Palgrave Macmillan.

Horton, J., & Kraftl, P. (2018). Rats, assorted shit and 'racist groundwater': Towards extra-

sectional understandings of childhoods and social-material processes. *Environment and Planning D: Society and Space*, **36**(5), 926–948.

Howe, J. N. (2010). Familiarity and no Pleasure. The Uncanny as an Aesthetic Emotion. *Image & Narrative*, **11**(3), 42–63.

Huss, S. (2016). Measuring human experiences of public spaces: A methodology in the making. *Conscious Cities*, **1**.

Huyssen, A. (1996). Monumental seduction. *New German Critique*, **69**, 181–200.

Huyssen, A. (2003). Monumental Seduction: Christo in Berlin. In *Present Pasts: Urban Palimpsests and the Politics of Memory* (pp. 30–48). Stanford, CA: Stanford University Press.

Huyssen, A. (2006). Nostalgia for Ruins. *Grey Room*, **23**(23), 6–21.

Information Commissioner's Office. (2017). Body Worn Video. Retrieved October 5, 2017, from https://ico.org.uk/for-organisations/guide-to-data-protection/encryption/scenarios/body-worn-video/

Inglis, D., Bone, J., & Wilkie, R. (2005). *Nature: Critical Concepts in the Social Sciences*. London: Routledge.

Ingold, T. (1993). The Temporality of Landscape. *World Archaeology*, **25**(2), 152–174.

Ingold, T. (2000a). *Perception of the Environment: Essays in Livelihood, Dwelling and Skill*. London: Routledge.

Ingold, T. (2000b). *The Perception of the Environment*. London: Routledge.

Ingold, T., & Pálsson, G. (2013). *Biosocial Becomings: Integrating Social and Biological Anthropology*. Cambridge: Cambridge University Press.

Itti, L., Rees, G., & Tsotsos, J. K. (2005). *Neurobiology of Attention*. Amsterdam: Elsevier.

Jaafar, M., Noor, S. M., & Rasoolimanesh, S. M. (2015). Perception of young local residents toward sustainable conversation programmes: A case study of the Lenggong World Cultural Heritage Site. *Tourism Management*, **48**, 154–163.

Jackson, P. (2000). Rematerializing social and cultural geography. *Social & Cultural Geography*, **1**(1), 9–14.

Jackson, S. (1993). Even sociologists fall in love: an exploration in the sociology of emotions. *Sociology*, **27**, 201–220.

Jacobs, J. (1972). *The Death and Life of Great American Cities* (Vol. 71).

Jacobs, J. (2006). A geography of big things. *Cultural Geographies*, **13**, 1–12.

Jacobs, J., & Nash, C. (2003). Too little, too much: cultural feminist geographies. *Gender, Place & Culture*, **10**(3), 265–279.

Jakle, J. A., & Wilson, D. (1992). *Derelict landscapes: The wasting of America's built environment*. Lanham: Rowman & Littlefield Publishers.

James, W. (1884). What is an emotion? *Mind*, **9**, 188–205.

James, W. (1890). *Principles of Psychology: Volume I*. New York, NY: Henry Holt and Company.

Jarvis, C. H., Kraftl, P., & Dickie, J. (2017). (Re)Connecting spatial literacy with children's geographies: GPS, Google Earth and children's everyday lives. *Geoforum*, **81**, 22–31.

Jewellery Quarter Development Trust. (2013). JQDT Neighbourhood Planning Forum: Constitution. Birmingham.

Jewellery Quarter Development Trust. (2017). JQ Cemeteries. Retrieved May 8, 2017, from http://jewelleryquarter.net/visit/public-spaces/jq-cemeteries/

Jewellery Quarter Heritage. (2018). Historical Buildings. Retrieved July 12, 2018, from https://jqheritage.co.uk/category/historical-buildings/

Johansen, B. S. (2015). Locating hatred: On the materiality of emotions. *Emotion, Space and Society*, **16**, 48–55.

Johnson, N. C. (2015). Heritage and Geography. In E. Waterton & S. Watson (Eds.), *The Palgrave Handbook of Contemporary Heritage Research* (pp. 159–173). Basingstoke: Palgrave Macmillan.

Jones, O. (2003). "Endlessly Revisited and Forever Gone": On Memory, Reverie and Emotional Imagination in Doing Children's Geographies. An "Addendum" to ' 'To Go Back up the Side Hill': Memories, Imaginations and Reveries of Childhood' by Chris Philo. *Children's Geographies*, **1**(1), 25–36.

Jones, O. (2011). Geography, Memory and Non-Representational Geographies. *Geography Compass*, **5**(12), 875–885.

Jones, O. (2015). "Not Promising a Landfall …": An Autotopographical Account of Loss of Place, Memory and Landscape. *Environmental Humanities*, **6**(1), 1–27.

Jones, O., & Garde-Hansen, J. (2012). *Geography and Memory: Explorations in Identity, Place and Becoming*. New York: Palgrave Macmillan.

Jones, P. (2014). Performing sustainable transport: a RIDE across the city. *Cultural Geographies*, **21**(2), 282–287.

Jones, P., & Evans, J. (2012). Rescue geography: place making, affect and regeneration. *Urban Studies*, **49**(11), 2315–2330.

Jones, P. I., & Osborne, T. (In press). Analysing virtual landscapes using postmemory. *Social and Cultural Geography*, https://doi.org/10.1080/14649365.2018.1474378

Jones, P., Isakjee, A., Jam, C., Lorne, C., & Warren, S. (2017). Urban landscapes and the atmosphere of place: exploring subjective experience in the study of urban form. *Urban Morphology*, **21**(1), 29–40.

Jones, P., Layard, A., Speed, C., & Lorne, C. (2015). MapLocal: Use of Smartphones for Crowdsourced Planning. *Planning Practice & Research*, **30**(3), 322–336.

Jones, R. (2009). Categories, borders and boundaries. *Progress in Human Geography*, **33**(2), 174–189.

Kaplan, S., & Kaplan, R. (1982). *Humanscape*. Ann Arbor, MI: Ulrich's Books.

Kaplan, S., & Kaplan, R. (1989). *The Experience of Nature: A Psychological Perspective*. Cambridge: Cambridge University Press.

Katz, S., & Peters, K. R. (2008). Enhancing the mind? Memory medicine, dementia, and the aging brain. *Journal of Aging Studies*, **22**(4), 348–355.

Kearns, R. A., & Collins, D. C. A. (2000). New Zealand children's health camps: therapeutic landscapes meet the contract state. *Social Science & Medicine*, **51**(7), 1047–1059.

Keller, E. F. (1982). Feminism and science. *Signs: Journal of Women in Culture and Society*, **7**(3), 589–602.

Keltner, D., & Gross, J. J. (1999). Functional accounts of emotion. *Cognition & Emotion*, **13**(5), 467–480.

Kindon, S. (2003). Participatory video in geographic research: A feminist practice of looking? *Area*, **35**(2), 142–153.

Kistemann, T. (2016). Das Konzept der Therapeutischen Landschaften. In U. Gebhard & T. Kistemann (Eds.), *Landschaft, Identität und Gesundheit: Zum Konzept der Therapeutischen Landschaften* (pp. 123–149). Wiesbaden: Springer VS.

Kiverstein, J. (2012). The Meaning of Embodiment. *Topics in Cognitive Science*, **4**(4), 740–758.

Klein, J. T. (1990). *Interdisciplinarity: History, Theory, and Practice*. Detroit: Wayne State University Press.

Kleinmann, A., & Barad, K. (2012). Intra-actions: An interview with Karen Barad. *Mousse Magazine*, **32**, 76–81.

Klenotic, J. (2011). Putting Cinema History on the Map: Using GIS to Explore the Spatiality of Cinema. In R. Maltby, D. Biltereyst, & P. Meers (Eds.), *Explorations in New Cinema History: Approaches and Case Studies* (pp. 58–84). Oxford: Wiley-Blackwell.

Knigge, L. D., & Cope, M. (2006). Grounded visualization: integrating the analysis of qualitative and quantitative data through grounded theory and visualization.

Environment and Planning A, **38**(11), 2021–2037.

Kohn, M. (2012). Toronto's Distillery District: Consumption and Nostalgia in a Post-Industrial Landscape. *Globalizations*, **7**(3), 359–369.

Kong, L. (2010). Global shifts, theoretical shifts: changing geographies of religion. *Progress in Human Geography*, **34**(6), 755–776.

Konner, M. (1991). Human Nature and Culture: Biology and the Residue of Uniqueness. In J. J. Sheehan & M. Sosna (Eds.), *The Boundaries of Humanity: Humans, Animals, Machines* (pp. 103–124). Berkeley, CA: University of California Press.

Korf, B. (2008). A neural turn? On the ontology of the geographical subject. *Environment and Planning A*, **40**(3), 715–732.

Korpela, K. M., Ylén, M., Tyrväinen, L., & Silvennoinen, H. (2010). Favorite green, waterside and urban environments, restorative experiences and perceived health in Finland. *Health Promotion International*, **25**(2), 200–209.

Kos, T., Markezic, I., & Pokrajcic, J. (2010). Effects of Multipath Reception on GPS Positioning Performance. In *52nd International Symposium Elmar* (pp. 399–402). Zadar, Crotia: IEEE.

Kraftl, P. (n.d.). *After Childhood: Retheorising Age, Generation and Youthfulness for Posthuman Times*. London: Routledge.

Kraftl, P. (2013). Beyond 'voice', beyond 'agency', beyond 'politics'? Hybrid childhoods and some critical reflections on children's emotional geographies. *Emotion, Space & Society*, **9**, 13–23.

Kraftl, P. (2015a). Memory and Autoethnographic Methodologies in Children's Geographies: Recalling Past and Present Childhoods. In R. Evans, L. Holt, & T. Skelton (Eds.), *Methodological Approaches* (pp. 1–23). Singapore: Springer Singapore.

Kraftl, P. (2015b). Mess/order: materials, timings, feelings. In *Geographies of Alternative Education: Diverse Learning Space for Children and Young People*. Bristol: Policy Press.

Kreibig, S. D. (2010). Autonomic nervous system activity in emotion: a review. *Biological Psychology*, **84**(3), 394–421.

Kreibig, S. D. (2012). Emotion, motivitation, and cardiovascular response. In R. A. Wright & G. H. Gendolla (Eds.), *How Motivation Affects Cardiovascular Response: Mechanisms and Applications* (pp. 93–117). Washington D.C.: American Psychological Association.

Krishna, S. (1994). Cartographic anxiety: mapping the body politic in India. *Alternatives*, **19**, 507–521.

Kuo, F. E., & Sullivan, W. C. (2001). Aggression and violence in the inner city: Effects of environment via mental fatigue. *Environment and Behavior*, *33*(4), 543–571.

Kwan, M.-P. (2007). Affecting Geospatial technologies: Toward a Feminist Politics of Emotion. *The Professional Geographer*, **59**(1), 22–34.

Kwan, M.-P., & Knigge, L. D. (2006). 'Doing qualitative research with GIS: an oxymoronic endeavor?' *Environment and Planning A*, **38**(11), 1999–2002.

Kwan, M.-P., & Lee, J. (2004). Geovisualization of human activity patterns using 3D GIS: a time- geographic approach. In M. F. Goodchild & D. Janelle (Eds.), *Spatially Integrated Social Science* (pp. 48–66). New York: Oxford University Press.

Ladd, B. (1997). Berlin Walls. In *The Ghosts of Berlin* (pp. 7–39). Chicago; London: University of Chicago Press.

Lähdesmäki, T. (2016). Politics of tangibility, intangibility, and place in the making of a European cultural heritage in EU heritage policy. *International Journal of Heritage Studies*, **22**(10), 766–780.

Lakoff, G., & Johnson, M. (1999). *Philosophy in the flesh: The embodied mind and its challenge to western thought*. New York: Basic Books.

Land, N. (2018). Fat knowledges and matters of fat: towards re-encountering fat(s). *Social Theory & Health*, **16**(1), 77–93.

Land, N., & Danis, I. (2016). Movement/ing Provocations in Early Childhood Education. *Journal of Childhood Studies*, **41**(3), 26–37.

Land Registry. (2018). Land Title: WM629873. Coventry: HM Land Registry.

Landry, C. (2006). The Sensory Landscape of Cities. In *The Art of City Making* (pp. 39–76). London: Earthscan.

Lange, E., & Schaeffer, P. V. (2001). A comment on the market value of a room with a view. *Landscape and Urban Planning*, **55**(2), 113–120.

Larkham, P. (1995). Heritage as planned and conserved. In D. T. Herbert (Ed.), *Heritage, Tourism and Society* (p. ?). London: Mansell.

Larregue, J., & Rollins, O. (In press). Biosocial criminology and the mismeasure of race. *Ethnic and Racial Studies*, https://doi.org/10.1080/01419870.2018.1527938

Latham, A. (1999). The Power of Distraction: Distraction, Tactility and Habit in the Work of Walter Benjamin. *Environment and Planning D: Society and Space*, **17**(4), 451–473.

Latham, A. (2003). Research, performance, and doing human geography: Some reflections

on the diary-photograph, diary-interview method. *Environment and Planning A*, **35**(11), 1993–2017.

Latour, B. (1993). *We Have Never Been Modern*. Cambridge, MA: Harvard University Press.

Latour, B. (2005). *Reassembling the Social: An Introduction to Actor-Network-Theory*. Oxford: Oxford University Press.

Lauder, W., Mummery, K., Jones, M., & Caperchione, C. (2006). A comparison of health behaviours in lonely and non-lonely populations. *Psychology, Health & Medicine*, **11**(2), 233–245.

Laurier, E. (2004). Doing Office Work on the Motorway. *Theory, Culture & Society*, **21**(4/5), 261–277.

Laurier, E. (2010). Being There/Seeing There: Recording and Analysising Life in a Car. In B. Finchman, M. McGuinness, & L. Murray (Eds.), *Mobile Methodologies* (pp. 103–117). Basingstoke: Palgrave Macmillan.

Laurier, E. (2014). Dissolving the dog: the home made video. *Cultural Geographies*, **21**, 627–638.

Laurier, E. (2015). YouTube: Fragments of a video-tropic atlas. *Area*, **48**(4), 488–495.

Laurier, E., & Parr, H. (2000). Emotions and interviewing in health and disability research. *Ethics, Place and Environment*, **3**, 61–102.

Laurier, E., & Philo, C. (2006). Possible geographies: A passing encounter in a cafe. *Area*, **38**(4), 353–363.

Law, J., & Mol, A. (1995). Notes on Materiality and Sociality. *The Sociological Review*, **43**(2), 274–294.

Lazarus, R. S. (1991). *Emotions and adaption*. New York: Oxford University Press.

Lederbogen, F., Kirsch, P., Haddad, L., Streit, F., Tost, H., Schuch, P., Wüst, S., Pruessner, J.C., Rietschel, M., Deuschle, M. and Meyer-Lindenberg, A. (2011). City living and urban upbringing affect neural social stress processing in humans. *Nature*, **474**(7352), 498–501.

LeDoux, J. E. (2000). Emotion Circuits in the Brain. *Annual Review of Neuroscience*, **23**, 155–184.

Lee, A. C. K., & Maheswaran, R. (2010). The health benefits of urban green spaces : a review of the evidence. *Journal of Public Health*, **33**(2), 212–222.

Lee, C. K., Yoo, S. K., Park, Y. J., Kim, N. H., Jeong, K. S., & Lee, B. C. (2005). Using Neural Network to Recognize Human Emotions from Heart Rate Variability and Skin

Resistance. In *Proceedings of the 2005 IEEE: Engineering in Medicine and Biology 27th Annual Conference* (pp. 5523–5525). Shanghai.

Lees, L. (2001). Towards a critical geography of architecture: the case of an ersatz. *Ecumene*, **8**, 51–86.

Lefebvre, H. (1991). *The Production of Space*. *Production* (Vol. 9).

Legacey, E.-M. (2016). Cities of the dead: the catacombs and Pere Lachaise Cemetery is post-revolutionary Paris. In L. Huskinson (Ed.), *The Urban Uncanny: A collection of interdisciplinary studies* (pp. 75–89). Abingdon: Routledge.

Legg, S. (2004). Memory and Nostalgia. *Cultural Geographies*, **11**(1), 99–107.

Legg, S. (2005). Contesting and surviving memory: space, nation, and nostalgia in Les Lieux de Mémoire. *Environment and Planning D: Society and Space*, **23**(4), 481–504.

Levenson, R. W. (2014). The Autonomic Nervous System and Emotion. *Emotion Review*, **6**(2), 100–112.

Lévi-Strauss, C. (1973). Structuralism and ecology. *Social Science Information*, **12**(1), 7–23.

Levine, J. (1983). Materialism and qualia. *Pacific Philosophical Quarterly*, **64**(4), 354–361.

Leyden, K. M. (2003). Social capital and the built environment: The importance of walkable neighborhoods. *American Journal of Public Health*, **93**(9), 1546–1551.

Leys, R. (2011). The Turn to Affect: A Critique. *Critical Inquiry*, **37**(3), 434–472.

Li, Q., Otsuka, T., Kobayashi, M., Wakayama, Y., Inagaki, H., Katsumata, M., Hirata, Y., Li, Y., Hirata, K., Shimizu, T. and Suzuki, H. (2011). Acute effects of walking in forest environments on cardiovascular and metabolic parameters. *European Journal of Applied Physiology*, **111**(11), 2845–2853.

Liben, L. S., Myers, L. J., Christensen, A. E., & Bower, C. A. (2013). Environmental-Scale Map Use in Middle Childhood: Links to Spatial Skills, Strategies, and Gender. *Child Development*, **84**(6), 2047–2063.

Lin, W. (2013). Situating performative neogeography: tracing, mapping, and performing "Everyone's East Lake." *Environment and Planning A*, **45**(1), 37–54.

Lindley, M. R., & Youdell, D. (2016). The absent body: bio-social encounters with the effects of physical activity on the wellbeing of children and young people. In *Families, Young People, Physical Activity and Health: Critical Perspectives* (pp. 13–28).

Lippard, L. (1997). *The Lure of the Local: Senses of Place in a Multicentered Society*. New York, NY: The New Press.

Little, J. (2015). Nature, wellbeing and the transformational self. *Geographical Journal*,

181(2), 121–128.

Llewellyn, D. H., Rohse, M., Day, R., & Fyfe, H. (2017). Evolving energy landscapes in the South Wales Valleys: Exploring community perception and participation. *Energy Policy*, **108**, 818–828.

Lobben, A. K. (2007). Navigational Map Reading: Predicting Performance and Identifying Relative Influence of Map-Related Abilities. *Annals of the Association of American Geographers*, **97**(1), 64–85.

Lobben, A. K., & Lawrence, M. (2014). Synthesized Model of Geospatial Thinking. *The Professional Geographer*, **67**(3), 307–318.

Lock, M. (1993). *Encounters with Aging: Mythologies of Menopause in Japan and North America*. Berkeley, CA: University of California Press.

Longhurst, R. (1995). The Body and Geography. *Gender, Place & Culture*, **2**(1), 97–106.

Longhurst, R. (1997). (Dis)embodied Geographies. *Progress in Human Geography*, **21**(4), 486–501.

Longhurst, R. (2010). Semi-structured interviews and focus groups. In N. J. Clifford, S. French, & G. Valentine (Eds.), *Key Methods in Geography* (pp. 103–115). London: SAGE.

Longhurst, R., Ho, E., & Johnston, L. (2008). Using "the Body" as an "Instrument of Research": Kimch'i and Pavlova. *Area*, **40**(2), 208–217.

Longhurst, R., Johnston, L., & Ho, E. (2009). A visceral approach: cooking 'at home' with migrant women in Hamilton, New Zealand. *Transactions of the Institute of British Geographers*, **34**(3), 333–345.

Longley, P. A. (2000). The academic success of GIS in geography: Problems and prospects. *Journal of Geographical Systems*, **2**(1), 37–42.

Lorimer, H. (2005). Cultural geography: the busyness of being "more-than-representational." *Progress in Human Geography*, **1**, 83–94.

Lorimer, H. (2012). Surfaces and Slopes - Remembering the World-Under-Foot. In O. Jones & J. Garde-Hansen (Eds.), *Geography and Memory: Explorations in Identity, Place and Becoming* (pp. 253–257). Basingstoke: Palgrave Macmillan.

Loveday, V. (2014). "Flat-capping it": Memory, nostagia and value in retroactive male working-class identification. *European Journal of Cultural Studies*, **17**(6), 721–735.

Lowenthal, D. (1998). *The Heritage Crusade and the Spoils of History*. Cambridge: Cambridge University Press.

Lowenthal, D. (2005). Natural and cultural heritage. *International Journal of Heritage*

Studies, **11**(1), 81–92.

Lucas, G. (2013). Ruins. In P. Graves-Brown, R. Harrison, & A. Piccini (Eds.), *The Oxford Handbook of the Archaeology of the Contemporary World* (pp. 192–203). Oxford: Oxford University Press.

Luh Sin, H. (2015). "You're Not Doing Work, You're on Facebook!": Ethics of Encountering the Field Through Social Media. *The Professional Geographer*, **67**(4), 676–685.

Lund, S. (2017). Sketchbook of a GPS artist. Retrieved May 19, 2017, from https://gpsdoodles.com/

Lupton, D. (1998). *Emotional Self : A Sociocultural Exploration. Emotional Self : A Sociocultural Exploration.* SAGE.

Lupton, D. (2012). M-health and health promotion: The digital cyborg and surveillance society. *Social Theory & Health*, **10**(3), 229–244.

Lupton, D. (2016). *The Quantified Self*. Cambridge, MA: Polity Press.

Luttik, J. (2000). The value of trees, water and open space as reflected by house prices in the Netherlands. *Landscape and Urban Planning*, **48**(3–4), 161–167.

Lyle, J. (2010). Stimulated recall: a report on its use in naturalistic research. *British Educational Research Journal*, **29**(6), 861–878.

Maas, J. (2008). *Vitamin G: Green environments - Healthy environments*. Utrecht.

Maas, J., Dillen, S. M. E. Van, Verheij, R. A., & Groenewegen, P. P. (2009). Social contacts as a possible mechanism behind the relation between green space and health. *Health & Place*, **15**, 586–595.

Maas, J., Verheij, R. A., Groenewegen, P. P., Vries, S. De, & Spreeuwenberg, P. (2006). Green space, urbanity, and health: how strong is the relation? *Journal of Epidemiology & Community Health*, **60**(7), 587–592.

Macdonald, S. (2013). *Memorylands: Heritage and Identity in Europe Today*. London; New York: Routledge.

MacKay, D. G., James, L. E., Taylor, J. K., & Marian, D. E. (2007). Amnesic H.M. exhibits parallel deficits and sparing in language and memory: Systems versus bing theory accounts. *Language and Cognitive Processes*, **22**, 377–452.

MacKay, D. G., Stewart, R., & Burke, D. (1998). H.M. Revisited: Relations between Language Comprehension, Memory, and the Hippocampal System. *Journal of Cognitive Neuroscience*, **10**, 377–394.

Macpherson, H. M. (2009a). The intercorporeal emergence of landscape: negotiating sight,

blindness, and ideas of landscape in the British countryside. *Environment and Planning A*, **41**(5), 1042–1054.

Macpherson, H. M. (2009b). Touch in the countryside: memory and visualization through the feet. *Senses and Society*, **4**(2), 179–195.

Macpherson, H. M. (2010). Non-representational approaches to body–landscape relations. *Geography Compass*, **4**(1), 1–13.

Maddrell, A. (2011). 'Praying the Keeills''. Rhythm, meaning and experience on pilgrimage journeys in the Isle of Man.' *Landabrefid*, **25**, 15–29.

Maddrell, A. (2012). Mapping Grief and Memory in John Banville's The Sea. In O. Jones & J. Garde-Hansen (Eds.), *Geography and Memory: Explorations in Identity, Place and Becoming* (pp. 58–89). London: Palgrave Macmillan.

Magrini, A., & Lisot, A. (2015). Noise reduction interventions in the urban environment as a form of control of indoor noise levels. *Energy Procedia*, **78**, 1653–1658.

Maguire, E. A., Frackowiak, R. S., & Frith, C. D. (1997). Recalling routes around london: activation of the right hippocampus in taxi drivers. *The Journal of Neuroscience : The Official Journal of the Society for Neuroscience*, **17**(18), 7103–7110.

Mah, A. (2012). *Industrial Ruination, Community, and Place: Landscapes and Legacies of Urban Decline*. Toronto: University of Toronto Press.

Malabou, C. (2007). *Les nouveaux blessés : De Freud à la neurologie, penser les traumatismes contemporains*. Paris: Bayard Press.

Malabou, C. (2008). *What Should We Do with Our Brain?* New York: Fordham University Press.

Malabou, C. (2009). *Changer de différence, le féminin et la question philosophique*. Paris: Galilée.

Marcus, C. C., & Sachs, N. A. (2013). *Therapeutic Landscapes: An Evidence-Based Approach to Designing Healing Gardens and Restorative Outdoor Spaces*. Hoboken, NJ: John Wiley & Sons.

Mark, D. D., Freksa, C., Hirtle, S. C., & Tversky, B. (1999). Cognitive models of geographical space. *International Journal of Geographical Information Science*, **13**(8), 727–774.

Marsh, P. T. (1994). *Joseph Chamberlain: Entrepreneur in Politics*. London: Yale University Press.

Martins, A. N. (2016). Sustainable Design, Cultural Landscapes and Heritage Parks; the Case of the Mondego River. *Sustainable Development*, **24**, 330–343.

Massey, D. (2005). *For Space*. London: SAGE.

Massey, D. (2011). Places and Their Pasts. *History*, **39**, 182–192.

Massumi, B. (2002). *Parables for the Virtual*. Duke University Press.

Mathewson, K. (2009). Carl Sauer and His Critics. In W. M. Denevan & K. Mathewson (Eds.), *Carl Sauer on Culture & Landscape: Readings and commentaries* (pp. 9–28). Baton Rouge, LA: LSU Press.

Matthews, S., Detwiler, J., & Burton, L. (2005). Geo-ethnography: coupling geographic information analysis techniques with ethnographic methods in urban research. *Cartographica*, **40**(4), 75–90.

McCormack, D. P. (2003). An event of geographical ethics in spaces of affect. *Transactions of the Institute of British Geographers*, **28**(4), 488–507.

McCormack, D. P. (2004). Drawing out the lines of the event. *Cultural Geographies*, **11**(2), 211–220.

McCormack, D. P. (2006). For the love of pipes and cables: A response to Deborah Thien. *Area*, **38**(3), 330–332.

McCormack, D. P. (2008). Engineering affective atmospheres on the moving geographies of the 1897 Andrée expedition. *Cultural Geographies*, **15**(4), 413–430.

McCormack, D. P. (2013). *Refrains for Moving Bodies: Experience and Experiment in Affective Space*. Duke University Press.

McDowell, L. (1992). Doing gender : feminists methods in human geography. *Transactions of the Institute of British Geographers*, **17**(4), 399–416.

McDowell, S. (2016). Heritage, memory and identity. In B. Graham & P. Howard (Eds.), *Ashgate Research Companion to Heritage and Identity* (pp. 37–53). Farnham: Ashgate Publishing Ltd.

McFadyen, J., & Rankin, J. (2016). The Role of Gatekeepers in Research: Learning from Reflexivity and Reflection. *Journal of Nursing and Health Care*, **4**(1), 82–88.

McFarlane, C. (2009). Translocal assemblages: Space, power and social movements. *Geoforum*, **40**(4), 561–567.

McFarlane, C. (2011). Assemblage and critical urbanism. *City*, **15**(2), 204–224.

McLafferty, S. (2005a). Geographic information and women's empowerment: A breast cancer example. In L. Nelson & J. Seager (Eds.), *A Companion to Feminist Geography* (pp. 486–495). Oxford: Blackwell Publishing.

McLafferty, S. (2005b). Women and GIS: Geospatial technologiesand feminist geographies. *Cartographica*, **40**(4), 37–45.

McMahon, S. (2014, May 2). The Vestmannaeyjar Islands are the Pompeii of the North. *Iceland Magazine*.

McMillan, D. W., & Chavis, D. M. (1986). Sense of community: A definition and theory. *Journal of Community Psychology*, **14**(1), 6–23.

Meijering, L., Lettinga, A. T., Nanninga, C. S., & Milligan, C. (2017). Interpreting therapeutic landscape experiences through rural stroke survivors' biographies of disruption and flow. *Journal of Rural Studies*, **51**, 275–283.

Meijering, L., & Weitkamp, G. (2016). Numbers and narratives: Developing a mixed-methods approach to understand mobility in later life. *Social Science & Medicine*, **168**, 200–206.

Meloni, M. (2014). How biology became social, and what it means for social theory. *The Sociological Review*, **62**(3), 593–614.

Meloni, M., Cromby, J., Fitzgerald, D., & Lloyd, S. (2018). Introducing the New Biosocial Landscape. In *The Palgrave Handbook of Biology and Society* (pp. 1–28). London; New York: Palgrave Macmillan.

Meloni, M., Williams, S. J., & Martin, P. (2016). The biosocial: sociological themes and issues. *The Sociological Review*, **64**(1), 7–25.

Merleau-Ponty, M. (2002). *Phenomenology of Perception*. London: Routledge.

Merrifield, A. (1993). Place and space: a Lefebvrian reconciliation. *Transactions of the Institute of British Geographers*, **18**(4), 516–531.

Merriman, P. (2014). Rethinking Mobile Methods. *Mobilities*, **9**(2), 167–187.

Middleton, J. (2011). Sense and the city: exploring the embodied geographies of urban walking. *Social & Cultural Geography*, **11**(6), 575–596.

Miller, D. (1991). *Material culture and mass consumption*. Hoboken, NJ: Blackwell Publishing.

Miller, D. S., & Rivera, J. D. (2006). Hallowed ground, place, and culture: The cemetery and the creation of place. *Space and Culture*, **9**(4), 334–350.

Milligan, C. (2007). Restoration or risk? Exploring the place of the common place. In Allison Williams (Ed.), *Therapeutic Landscapes* (pp. 245–272). Aldershot: Ashgate Publishing Ltd.

Milligan, C., & Bingley, A. (2007). Restorative places or scary spaces? The impact of woodland on the mental well-being of young adults. *Health & Place*, **13**(4), 799–811.

Mills, M. A., & Coleman, P. G. (1994). Nostalgic memories in dementia—a case study. *The International Journal of Aging and Human Development*, **38**(3), 203–219.

Mirpuri, S., Ocampo, A., Narang, B., Roberts, N., & Gany, F. (In Press). Discrimination as a social determinant of stress and health among New York City taxi drivers. *Journal of Health Psychology*. https://doi.org/https://doi.org/10.1177/1359105318755543

Misztal, B. (2002). *Theories of Social Remembering*. Milton Keynes: Open University Press.

Mitchell, D. (1995). There's no such thing as culture: towards a reconceptualization of the idea of culture in geography. *Transactions of the Institute of British Geographers*, **20**(1), 102–116.

Mitchell, D., & Heynen, N. (2009). The Geography of Survival and the Right to the City: Speculations on Surveillance, Legal Innovation, and the Criminalization of Intervention. *Urban Geography*, **30**(6), 611–632.

Mitchell, K. (2003). Monuments, Memorials, and the Politics of Memory. *Urban Geography*, **24**(5), 442–459.

Miura, K. (2004). *Contested Heritage People of Angkor*. PhD Thesis: SOAS University of London.

Miura, K. (2005). Conservation of a 'living heritage site' A contradiction in terms? A case study of Angkor World Heritage Site. *Conservation and Management of Archaeological Sites*, **7**(1), 3–18.

Miura, K. (2006). A note on the current impact of tourism on Angkor and its environs. *Conservation and Management of Archaeological Sites*, **8**(3), 132–135.

Miura, K. (2011a). From Property to Heritage. Different Notions, Rules of Ownership and Practices of New and Old Actors in the Angkor World Heritage Site. In B. Hauser-Schäublin (Ed.), *World Heritage Angkor and Beyond: Circumstances and Implications of UNESCO Listings in Cambodia* (pp. 97–120). Göttingen: Creative Commons.

Miura, K. (2011b). Sustainable Development in Angkor. Conservation Regime of the Old Villagescape and Development. In B. Hauser-Schäublin (Ed.), *World Heritage Angkor and Beyond: Circumstances and Implications of UNESCO Listings in Cambodia* (pp. 121–145). Göttingen: Creative Commons.

Miura, K. (2011c). World Heritage Making in Angkor, Global, Region, National and Local Actors, Interplays and Implications. In B. Hauser-Schäublin (Ed.), *World Heritage Angkor and Beyond: Circumstances and Implications of UNESCO Listings in Cambodia* (pp. 9–32). Göttingen: Creative Commons.

Montello, D. R. (2009). Cognitive geography. In R. Kitchin & N. Thrift (Eds.), *International Encyclopedia of Human Geography* (pp. 160–166). Amsterdam: Elsevier.

Montello, D. R., Fabrikant, S. I., Ruocco, M., & Middleton, R. S. (2003). Testing the First

Law of Cognitive Geography on Point-Display Spatializations. In W. Kuhn, M. F. Worboys, & S. Timpf (Eds.), *Spatial Information Theory. Foundations of Geographic Information Science* (pp. 316–331). Berlin: Springer.

Montgomery, J. (1998). Making a city: Urbanity, vitality and urban design. *Journal of Urban Design*, **3**(1), 93–116.

Moran, D. (2017). Carceral geography and the spatialization of carceral studies. In M. Brown & E. Carrabine (Eds.), *Routledge International Handbook of Visual Criminology* (pp. 89–100). Abingdon: Taylor & Francis.

Moran, J. (2002). Childhood and nostalgia in contemporary culture. *European Journal of Cultural Studies*, **5**(2), 155–173.

Morawski, J. G. (1988). *The Rise of Experimentation in American Psychology*. New Haven, CT: Yale University Press.

Morse, J. M. (1991). Strategies for sampling. In *Qualitative Nursing Research: A Contemporary Dialogue* (pp. 127–145). London: SAGE.

Moseley Community Development Trust. (2008). Moseley Action Plan. Birmingham.

Moseley Farmers Market (2019). Join Us! Retrived June 15, 2019, from http://moseleyfarmersmarket.org.uk/join-us/

Mott, C., & Roberts, S. M. (2014). Not everyone has (the) balls: Urban exploration and the persistence of masculinist geography. *Antipode*, **46**(1), 229–245.

Munjeri, D. (2004). Tangible and intangible heritage: from difference to convergence. *Museum International*, **56**(1–2), 12–20.

Muzaini, H. (2015). On the matter of forgetting and "memory returns." *Transactions of the Institute of British Geographers*, **40**, 102–112.

Nafus, D. (2016). *Quantified: Biosensing Technologies in Everyday Life*. Cambridge, MA: MIT Press.

Nastasi, B. K. (1999). Audiovisual methods in ethnography. In J. J. Schensul, M. D. LeCompte, B. K. Nastasi, & S. P. Borgatti (Eds.), *Enhanced Ethnographic Methods: Audiovisual Techniques, Focused Group Interviews, and Elicitation Techniques.* (pp. 1–50). Thousand Oaks, CA: Altamira Press.

National Geographic. (2017). What an Explorer's Brain Revealed about Edinburgh. Retrieved May 19, 2017, from http://www.nationalgeographic.com/cisco/case-study-edinburgh.html

Natural England. (2016). Monitor of engagement with the natural environment. Retrieved February 28, 2018, from https://www.gov.uk/government/collections/monitor-of-

engagement-with-the-natural-environment-survey-purpose-and-results

Nayak, A., & Jeffery, A. (2011). *Geographical Thought: An Introduction to Ideas in Human Geography*. London: Routledge.

Neff, G., & Nafus, D. (2016). *Self-Tracking*. Cambridge, MA: MIT Press.

Newton, T. (2003). Truly embodied sociolgy: marrying the social and the biological? *The Editorial Board of The Sociological Review*, 20–42.

Nguyen, D. (2010). Evidence of the impacts of urban sprawl on social capital. *Environment and Planning B: Planning and Design*, **37**(4), 610–627.

Nguyen, N. T., McFadden, A., Tangen, D., & Beutel, D. (2013). Video-Stimulated Recall Interviews in Qualitative Research. *Paper Presented at the AARE Annual Conference, Adelaide, AU*, **1**, 1–10.

Nicholas, L., Thapa, N. B., & Ko, Y. J. (2009). Residents' Perspectives of a World Heritage Site: The Pitons Management Area, St. Lucia. *Annals of Tourism Research*, **36**(3), 390–412.

Nightingale, A. (2003). A Feminist in the Forest: Situated Knowledges and Mixing Methods in Natural Resource Management. *ACME*, **2**(1), 77–90.

Nold, C. (2009). *Emotional Cartography: Technologies of the self*. Creative Commons.

Nora, P. (1989). Between Memory and History: Les Lieux de Mémoire. *Representations*, **26**(Spring), 7–24.

Nora, P. (1998). *Realms of Memory: The Construction of the French Past: Symbols*. New York, NY: Columbia University Press.

Nummenmaa, L., Glerean, E., Hari, R., & Hietanen, J. K. (2014). Bodily maps of emotions. *Proceedings of the National Academy of Sciences of the United States of America*, **111**(2), 646–651.

Nutsford, D., Pearson, A. L., Kingham, S., & Reitsma, F. (2016). Residential exposure to visible blue space (but not green space) associated with lower psychological distress in a capital city. *Health & Place*, **39**, 70–78.

O'Leary, Z. (2004). Exploring Populations. In *The Essential Guide to Doing Research* (pp. 102–112). London: SAGE.

Oatley, K., & Johnson-Laird, P. N. (2014). Cognitive approaches to emotions. *Trends in Cognitive Sciences*, **18**(3), 134–140.

Öhrström, E. (2004). Longitudinal surveys on effects of changes in road traffic noise—annoyance, activity disturbances, and psycho-social well-being. *The Journal of the Acoustical Society of America*, **115**(2), 719–729.

Olsson, G. (1991). *Lines of Power/Limits of Language*. Minneapolis: University of Minnesota Press.

ONS. (2011). 2011 Census. UK Data Service.

Orbasli, A. (2000). *Tourists in Historic Towns: Urban Conservation & Heritage Management*. London: E & FN SPON.

Orsi, F., & Geneletti, D. (2013). Using geotagged photographs and GIS analysis to estimate visitor flows in natural areas. *Journal for Nature Conservation*, **21**(5), 359–368.

Osborne, T. (2017). Ascribing Value: The Use of Biosensing in Heritage Landscapes. *Conscious Cities: Anthology*, *2*. Retrieved from http://www.ccities.org/ascribing-value-use-biosensing-heritage-landscapes/

Osborne, T. (2019). Biosensing: a critical reflection on doing memory research through the body. In D. Drozdsewski & C. Birdsall (Eds.), *Doing Memory Research: New Methods and Approaches* (pp. 63–85). Singapore: Palgrave Macmillan.

Osborne, T., & Jones, P. (2017). Biosensing and geography: a mixed methods approach. *Applied Geography*, **87**, 160–169.

Osborne, T. S. D., & Rose, N. (1999). Do the Social Sciences Create Phenomena? The example of public opinion research. *British Journal of Sociology*, *50*(3), 367–396.

Osborne, T., Warner, E., Jones, P. I., & Resch, B. (2019). Performing social media: artistic approaches to analysing big data. *Geohumanities*, **5**(1), 282–294.

Pacini-Ketchabaw, V., & Clark, V. (2016). Following watery relations in early childhood pedagogies. *Journal of Early Child Research*, **14**(1), 98–111.

Pacione, M. (2003). Urban environmental quality and human wellbeing - A social geographical perspective. *Landscape and Urban Planning*, **65**(1–2), 19–30.

Pain, R. H., MacFarlane, R., Turner, K., & Gill, K. (2006). When, where, if and but: residents qualify the effect of streetlighting on crime and fear in their neighbourhoods. *Environment and Planning A*, **38**(11), 2055–2074.

Pallasmaa, J. (2012). *The Eyes of the Skin: Architecture and the Senses*. Chichester: John Wiley & Sons.

Pallasmaa, J. (2013). Towards a Neuroscience of Architecture. In Philip Tidwell (Ed.), *Architecture and Neuroscience* (pp. 4–21). Espoo: Tapio Wirkkala—Rut Bryk Foundation.

Palmer, R. (1996). A further case for the preservation of earthwork ridge-and-furrow. *Antiquity*, **70**(268), 436–440.

Pálsson, G. (2013). Situating nature: Ruins of modernity as náttúruperlur. *Tourist Studies*,

13(2), 172–188.

Pálsson, G. (2016). Unstable bodies: biosocial perspectives on human variation. *The Sociological Review Monographs*, **64**(1), 100–116.

Papoulias, C., & Callard, F. (2010). Biology's gift: Interrogating the turn to affect. *Body & Society*, **16**(1), 29–56.

Paradise Birmingham. (2018). The Vision. Retrieved January 2, 2018, from https://www.paradisebirmingham.co.uk/the-vision/

Park, B.-J., Tsunetsugu, Y., Kasetani, T., Hirano, H., Kagawa, T., Sato, M., & Miyazak, Y. (2007). Physiological effects of shinrin-yoku (taking in the atmosphere of the forest) - using salivary cortisol and cerebral activity as indicators. *Journal of Physiological Anthropology*, **26**(2), 123–128.

Park, B.-J., Tsunetsugu, Y., Kasetani, T., Kagawa, T., & Miyazaki, Y. (2010). The physiological effects of Shinrin-yoku (taking in the forest atmosphere or forest bathing): evidence from field experiments in 24 forests across Japan. *Environmental Health and Preventive Medicine*, **15**(1), 18–26.

Park, G., & Evans, G. (2016). Environmental stressors, urban design and planning: implications for human behaviour and health. *Journal of Urban Design*, **21**(4), 453–470.

Parks, L. (2001). Plotting the personal: Global Positioning Satellites and interactive media. *Cultural Geographies*, **8**(2), 209–222.

Parr, H. (1998). Mental health, ethnography and the body. *Area*, **30**(1), 28–37.

Parr, H. (2007). Collaborative film-making as process, method and text in mental health research. *Cultural Geographies*, **14**(1), 114–138.

Paterson, M. (2007). Affecting Touch: Towards a "Felt" Phenomenology of Therapeutic Touch. In J. Davidson, L. Bondi, & M. Smith (Eds.), *Emotional geographies* (pp. 161–176). Oxon: Routledge.

Paterson, M. (2009). Haptic geographies: ethnography, haptic knowledges and sensuous dispositions. *Progress in Human Geography*, **33**(6), 766–788.

Peckham, R. S. (2003). *Rethinking Heritage. Cultures and Politics in Europe*. London: I.B. Tauris.

Pedwell, C., & Whitehead, A. (2012). Affecting Feminsim: Questions of Feeling in Feminist Theory. *Feminist Theory*, **13**(2), 115–129.

Pendola, R., & Gen, S. (2008). Does "Main Street" promote sense of community? A comparison of San Francisco neighborhoods. *Environmental and Behavior*, **40**(4),

545–574.

Peper, E., Harvey, R., Lin, I.-M., Tylova, H., & Moss, D. (2007). Is there more to blood volume pulse than heart rate variability, respiratory sinus arrhythmia, and cardiorespiratory synchrony? *Biofeedback*, **35**(2), 54–61.

Perini, K. (2016). Green and Blue Infrastructure in Cities. In K. Perini & P. Sabbion (Eds.), *Urban Sustainability and River Restoration: Green and Blue Infrastructure* (pp. 3–9). Chichester: John Wiley & Sons.

Perkins, C. (2004). Cartography – cultures of mapping: power in practice. *Progress in Human Geography*, **28**(3), 381–391.

Perkins, C. (2009). Performative and Embodied Mapping. In R. Kitchin & N. Thrift (Eds.), *International Encyclopedia of Human Geography* (pp. 126–132). Amsterdam: Elsevier.

Perriam, G. (2015). Sacred spaces, healing places: therapeutic landscapes of spiritual significance. *Journal of Medical Humanities*, **36**(1), 19–33.

Peter, C., & Herbon, A. (2006). Emotion representation and physiology assignments in digital systems. *Interacting with Computers*, **18**(2), 139–170.

Philip, L. J. (1998). Combining quantitative and qualitative approaches to social research in human geography - an impossible mixture? *Environment and Planning A*, **30**, 261–276.

Philo, C. (2003). "To Go Back up the Side Hill": Memories, Imaginations and Reveries of Childhood. *Children's Geographies*, **1**(1), 7–23.

Picard, R. W. (1997). *Affective Computing*. Cambridge: MIT Press.

Picard, R. W. (2003). Affective computing: Challenges. *International Journal of Human Computer Studies*, **59**(1–2), 55–64.

Picard, R. W., & Healey, J. (1997). Affective wearables. *Personal and Ubiquitous Computing*, **1**(4), 231–240.

Picard, R. W., Vyzas, E., & Healey, J. (2001). Toward machine emotional intelligence: Analysis of affective physiological state. *IEEE Transactions on Pattern Analysis and Machine Intelligence*, **23**(10), 1175–1191.

Pickering, M., & Keightley, E. (2006). The modalities of nostalgia. *Current Sociology*, **54**(6), 919–941.

Pickles, J. (1995). *Ground Truth: the social implications of geographic systems*. New York: Guilford Press.

Pickles, J. (2004). *A History of Spaces: Cartographic Reason, Mapping, and the Geo-coded World*. London: Routledge.

Pierce, J., & Martin, D. G. (2015). Placing Lefebvre. *Antipode*, **47**(5), 1279–1299.

Pile, S. (2010). Emotions and affect in recent human geography. *Transactions of the Institute of British Geographers*, **35**(1), 5–20.

Pile, S. (2011). For a geographical understanding of affect and emotions. *Transactions of the Institute of British Geographers*, **36**(4), 603–606.

Pink, S. (2001). More visualising, more methodologies: on video, reflexivity and qualitative research. *The Sociological Review*, **49**(4), 586–599.

Pink, S. (2004). Performance, Self-Representation and Narrative: Interviewing with Video. In C. J. Pole (Ed.), *Seeing is Believing? Approaches to Visual Research* (pp. 61–77). Oxford: Elsevier Ltd.

Pink, S. (2006). *Doing Visual Ethnography* (Vol. 1st). London: SAGE.

Pink, S. (2007). Walking with video. *Visual Studies*, **22**(3), 240–252.

Pink, S., Sumartojo, S., Lupton, D., & Heyes LaBond, C. (2017). Empathetic technologies: digital materiality and video ethnography. *Visual Studies*, **32**(4), 371–381.

Pitts-Taylor, V. (2010). The plastic brain: Neoliberalism and the neuronal self. *Health*, **14**(6), 635–652.

Pitts-Taylor, V. (2016). *The Brain's Body*. Durham, NC: Duke University Press.

Plaza, B., & Haarich, S. (2009). Museums for urban regeneration? Exploring conditions for their effectiveness. *Journal of Urban Regeneration & Renewal*, **2**(3), 259–271.

Pollard, J. S. (2007). Making Money, (Re)Making Firms: Microbusiness Financial Networks in Birmingham's Jewellery Quarter. *Environment and Planning A*, **39**, 378–397.

Pomerantz, A. (2005). Working minds: A Practitioner's Guide to Cognitive Task Analysis. In J. Molder & J. Potter (Eds.), *Talk and Cognition: Discourse, Mind, and Social Interaction* (pp. 93–113). Cambridge, MA: Cambridge University Press.

Porteous, D., & Smith, S. E. (2001). Introducing Domicide. In *Domicide: The global destruction of home* (pp. 3–23). Kingston: McGill-Queen's University Press.

Porteous, J. D. (1985). Smellscape. *Progress in Physical Geography*, **9**(3), 356–378.

Pred, A. (1983). From Here and Now to There and Then: Some Notes of Diffusions, Defusions, and Disillusions. In M. Billinge, D. Gregory, & R. Martin (Eds.), *Recollections of a Revolution: Geography as Spatial Science* (pp. 86–95). New York, NY: St. Martins Press.

Prinz, J. (2005). Are Emotions Feelings? *Journal of Consciousness Studies*, **12**(8–10), 9–25.

Probyn, E. (1996). *Outside Belongings*. London: Routledge.

Probyn, E. (2001). *Carnal appetites: food sex identities*. New York, NY: Routledge.

Protevi, J. (2008). Affect, agency and responsibility: The act of killing in the age of cyborgs. *Phenomenology and the Cognitive Sciences*, **7**(3), 405–413.

Protevi, J. (2009). *Political affect: Connecting the social and the somatic*. Minneapolis: University of Minnesota Press.

Protevi, J. (2010). Adding deleuze to the mix. *Phenomenology and the Cognitive Sciences*, **9**(3), 417–436.

Protevi, J. (2013). *Life, War, Earth: Deleuze and the Sciences*. Minneapolis: University of Minnesota Press.

Prout, A. (2005). *The Future of Childhood: Towards the interdisciplinary study of children*. London: Routledge Falmer.

Pykett, J. (2015). *Brain Culture: Shaping Policy through Neuroscience*. Policy Press.

Pykett, J. (2018). Geography and neuroscience: Critical engagements with geography's "neural turn." *Transactions of the Institute of British Geographers*, **43**(2), 154–169.

Pykett, J., & Disney, T. (2016). Brain-Targeted Teaching and the Biopolitical Child. *Poltics, Citizenship and Rights*, **7**, 133–152.

Quercia, D., Schifanella, R., Aiello, L. M., & McLean, K. (2015). Smelly Maps: The Digital Life of Urban Smellscapes. In *Ninth International AAAI Conference on Web and Social Media* (pp. 327–336). Oxford: AAAI.

Rabinow, P. (1996). *Essays on the Anthropology of Reason*. Princeton, NJ: Princeton University Press.

Rabinow, P., & Rose, N. (2006). Biopower Today. *BioSocieties*, **1**(2), 195–217.

Rahman, S. (2012). *Heritage Tourism and the Built Environment*. PhD Thesis: University of Birmingham.

Ramshaw, G. (2010). Living Heritage and the Sports Museum: Athletes, Legacy and the Olympic Hall of Fame and Museum, Canada Olympic Park. *Journal of Sports & Tourism*, **15**(1), 45–70.

Rangecroft, S., Birkinshaw, S., Rohse, M., Day, R., McEwen, L., Makaya, E., & Van Loon, A. (2018). Hydrological modelling as a tool for interdisciplinary workshops on future drought. *Progress in Physical Geography*, **42**(2), 237–256.

Ray, J. (1999). *Ecology of a Cracker Childhood*. Minneapolis: Milkweed Editions.

Reinharz, S., & Davidman, L. (1992). *Feminist Methods in Social Research*. Oxford: Oxford University Press.

Rekret, P. (2016). A critique of new materialism: ethics and ontology. *Subjectivities*, **9**(3), 225–245.

Relph, E. (1976). *Place and placelessness*. London: Pion.

Renwick, C. (2012). *British Sociology's Lost Biological Roots: A History of Futures Past*. Basingstoke: Palgrave Macmillan.

Resch, B., Sudmanns, M., Sagl, G., Summa, A., Zeile, P., & Exner, J.-P. (2015). Crowdsourcing Physiological Conditions and Subjective Emotions by Coupling Technical and Human Mobile Sensors. *Journal for Geographic Information Science*, **1**, 514–524.

Resch, B., Summa, A., Sagl, G., Zeile, P., & Exner, J.-P. (2015). Urban Emotions — Geo-Semantic Emotion Extraction from Technical Sensors, Human Sensors and Crowdsourced Data. *Progress in Location-Based Services 2014*, 199–212.

Riger, S., & Lavrakas, P. J. (1981). Community ties: Patterns of attachment and social interaction in urban neighborhoods. *American Journal of Community Psychology*, **9**(1), 55–66.

Rishbeth, C., & Rogaly, B. (2017). Sitting outside: conviviality, self-care and the design of benches in urban public space. *Transactions of the Institute of British Geographers,* **43**(2), 284-298.

Roberts, D. (1988). Beyond progress: the museum and the montage. *Theory, Culture & Society*, **5**, 543–557.

Roberts, H., Sadler, J., & Chapman, L. (2019). The value of Twitter data for determining the emotional responses of people to urban green spaces: A case study and critical evaluation. *Urban Studies*, **56**(4), 818-835.

Robertson, I., & Richards, P. (2003). *Studying Cultural Landscapes*. London: Arnold.

Robinson, G. E. (2004). Beyond Nature and Nurture. *Science*, **304**(5669), 397–399.

Rodaway, P. (2002). *Sensuous geographies: body, sense and place*. London: Routledge.

Rose-Redwood, R., Alderman, D. H., & Azaryahu, M. (2008). Collective Memory and the Politics of Urban Space: An Introduction. *GeoJournal*, **73**(3), 161–164.

Rose, G. (1993). *Feminism and Geography: The Limits of Geographical Knowledge.* Cambridge: Polity Press.

Rose, G. (2003). On the Need to Ask How, Exactly, Is Geography "Visual"? *Antipode*, **35**, 212–221.

Rose, G., Degen, M. M., & Basdas, B. (2010). More on "big things": Building events and feelings. *Transactions of the Institute of British Geographers*, **35**(3), 334–349.

Rose, M., & Wylie, J. (2006). Animating landscape. *Environment and Planning D: Society and Space*, **24**, 475–479.

Rose, N. (2001). The politics of life itself. *Theory, Culture & Society*, **18**(6), 1–30.

Rose, N. (2009). *The Politics of Life Itself: Biomedicine, Power, and Subjectivity in the Twenty-First Century*. Princeton, NJ: Princeton University Press.

Rose, N. (2013). The Human Sciences in a Biological Age. *Theory, Culture & Society*, **30**(1), 3–34.

Rose, S. (1997). *Lifelines: biology, determinism, freedom*. Harmondsworth: Penguin.

Rosenstein, B. (2002). Video use in social science research and program evaluation. *International Journal of Qualitative Methods*, **1**, 22–43.

Ross, M. (1996). *Planning and the Heritage: Policy and procedures*. London: E & FN SPON.

Rössler, M. (2006). World heritage cultural landscapes: a UNESCO flagship programme 1992–2006. *Landscape Research*, **31**(4), 333–353.

Rottenberg, J., & Gross, J. J. (2003). When emotion goes wrong: Realizing the Promise of Affective Science. *Clinical Psychology: Science and Practice*, **10**(2), 227–232.

Routledge, C., Wildschut, T., Sedikides, C., Juhl, J., & Arndt, J. (2012). The power of the past: Nostalgia as a meaning-making resource. *Memory*, **20**(5), 452–460.

Royle, N. (2003). *The Uncanny*. Manchester: Manchester University Press.

Rugg, J. (2000). Defining the place of burial: What makes a cemetery a cemetery? *Mortality*, **5**(3), 259–275.

Ruppert, E. S. (2006). Rights to Public Space: Regulatory Reconfigurations of Liberty. *Urban Geography*, **2***7*(3), 271–292.

Ruskamp, P. (2016). *Your Environment and You: Investigating Stress Triggers and Characteristics of the Built Environment*. Master Thesis: Kansas State University.

Rutter, J. (2006). *Genes and behavior: Nature-nurture interplay explained*. Malden, MA: Blackwell Publishing.

Ryan, K. W. (2011). The new wave of childhood studies: Breaking the grips of bio-social dualism? *Childhood*, **19**(4), 439–452.

Rye, C. (2003). Incorporating practice: A multi-viewpoint approach to performance documentation. *Journal of Media Practice*, **3**(2), 115–123.

Salazar-López, E., Domínguez, E., Juárez Ramos, V., de la Fuente, J., Meins, A., Iborra, O., Gálvez, G., Rodríguez-Artacho, M. A. & Gómez-Milán, E. (2015). The mental and subjective skin: Emotion, empathy, feelings and thermography. *Consciousness and*

Cognition, **34**, 149–162.

Samara, T., & Tsitsoni, T. (2011). The effects of vegetation on reducing traffic noise from a city ring road. *Noise Control Engineering Journal*, **59**(1), 68–74.

Sarkissian, W., & Heine, W. (1978). *Social Mix: The Bournville Experience*. Adelaide: The Bournville Village Trust and South Austrailian Housing Trust.

Sauer, C. (2007). The morphology of landscape. *Foundation Papers in Landscape Ecology*, **2**(2), 36–70.

Scanlan, S. (2005). Introduction : Nostalgia. *Iowa Journal of Cultural Studies*, **5**, 3–9.

Scherer, K. R. (2000). Psychological models of emotion. *The Neuropsychology of Emotion*, **137**(3), 137–162.

Schwanen, T. (2018). Thinking complex interconnections: transition, nexus and geography. *Transactions of the Institute of British Geographers*, **43**(2), 262–283.

Schwartz, M. S., & Andrasik, F. (2003). *Biofeedback: A Practioner's Guide*. New York: Guilford Press.

Seamon, D. (1979). *A Geography of the Lifeworld: Movement, Rest and Encounter*. London: Croom Helm.

Sedenberg, E., Wong, R., & Chuang, J. (2018). A Window into the Soul: Biosensing in Public. In B. C. Newell, T. Timan, & B.-J. Koops (Eds.), *Surveillance, Privacy and Public Space* (pp. 75–98). Abingdon: Routledge.

Seigworth, G. J., & Gregg, M. (2010). An Inventory of Shimmers. In G. J. Seigworth & M. Gregg (Eds.), *The Affect Theory Reader* (pp. 1–25). Duke University Press.

Selly Manor Museum. (2017). Selly Manor. Retrieved July 7, 2016, from http://www.sellymanormuseum.org.uk/explore-visit-us/selly-manor/

Seremetakis, C. (1994). The memory of the sense part one: Marks of the transitiory. In *The Senses Still: Perception and Memory as Material Culture in Modernity* (pp. 1–19). Chicago: University of Chicago Press.

Seremetakis, N. (1994). *The senses still: perception and memory as material culture in modernity*. Oxford: Westview Press.

Setchell, J. M., Fairet, E., Shutt, K., Waters, S., & Bell, S. (2017). Biosocial Conservation: Integrating Biological and Ethnographic Methods to Study Human–Primate Interactions. *International Journal of Primatology*, **38**(2), 401–426.

Sexton, A. E. (2016). Alternative Proteins and the (Non)Stuff of "Meat." *Gastronomia: The Journal of Critical Food Studies*, **16**(3), 66–78.

Sexton, A. E., Hayes-Conroy, A., Sweet, E. L., Miele, M., & Ash, J. (2017). Better than

text? Critical reflections on the practices of visceral methodologies in human geography. *Geoforum*, **82**, 200–201.

Shaheen, M., & Pradhan, S. (2019). Sampling in Qualitative Research. In M. Gupta, M. Shaheen, & K. P. Reddy (Eds.), *Qualitative Techniques for Workplace Data Analysis* (pp. 25–51). Hershey, PA: IGI Global.

Sharp, J. (2009). Geography and gender: what belongs to feminist geography? Emotion, power and change. *Progress in Human Geography*, **33**(1), 74–80.

Shaw, R. (2014). Beyond night-time economy: Affective atmospheres of the urban night. *Geoforum*, **51**, 87–95.

Sheppard, E. (1993). Automated geography: What kind of geography for what kind of society. *The Professional Geographer*, **45**, 457–460.

Shields, R. (1999). *Lefebvre, Love and Struggle: Spatial Dialectics*. London: Routledge.

Shouse, E. (2005). Feeling, Emotion, Affect. *M/C Journal*, **8**, 12–15.

Shoval, N., Schvimer, Y., & Tamir, M. (2018a). Real-Time Measurement of Tourists' Objective and Subjective Emotions in Time and Space. *Journal of Travel Research*, **57**(1), 3-16.

Shoval, N., Schvimer, Y., & Tamir, M. (2018b). Tracking technologies and urban analysis : Adding the emotional. *Cities*, **72**(1240), 34–42.

Sibley, D. (1991). Children's geographies: some problems of representation. *Area*, **23**(3), 269–260.

Silverman, D. (2001). *Interpreting Qualitative Data: Methods for analysing talk, text and interaction*. London: SAGE.

Simmel, G. (1958). Two Essays: "The Handle" and "The Ruin." *The Hudson Review*, **11**(3), 371–385.

Simmel, G. (1971). Metropolis and Mental Life. In D. N. Levine (Ed.), *Georg Simmel on Individuality and Social Forms: Selected Writings* (pp. 324–339). Chicago, IL: University of Chicago Press.

Simpson, P. (2010). *Ecologies of Street Performance*. PhD Thesis: University of Bristol.

Slater, T. R., & Larkham, P. (1996). Whose heritage? Conserving historical townscapes on Birmingham. In A. J. Gerrard & T. R. Slater (Eds.), *Managing a Conurbation: Birmingham and its Region* (pp. 241–261). Studley: Brewin Books.

Smith, L. (2006). *Uses of Heritage*. London: Routledge.

Smith, L., & Akagawa, N. (2008). Introduction. In L. Smith & N. Akagawa (Eds.), *Intangible Heritage* (pp. 1–9). London: Routledge.

Smith, L., & Campbell, G. (2016). The Elephant in the Room: Heritage, Affect, and Emotion. In W. Logan, M. N. Craith, & K. Ullrich (Eds.), *A Companion to Heritage Studies* (pp. 443–460). Chichester: John Wiley & Sons.

Smith, R. G. (2003). Baudrillard's non-representational theory: burn the signs and journey without maps. *Environment and Planning D: Society and Space*, **21**(1), 67–84.

Smyth, F. (2005). Medical geography: therapeutic places, spaces and networks. *Progress in Human Geography*, **29**(4), 488–495.

Soja, E. W. (1996). *Thirdspace: Journeys to Los Angeles and Other Real-and-Imagined Places*. Oxford: Blackwell Publishing.

Soler, H., Vinayak, P., & Quadagno, D. (2000). Biosocial aspects of domestic violence. *Psychoneuroendocrinology*, **25**(7), 721–739.

Spinney, J. (2007). Cycling the city: non-place and the sensory construction of meaning in a mobile practice. In D. Horton, P. Rosen, & P. Cox (Eds.), *Cycling and Society* (pp. 25–45). Aldershot: Ashgate Publishing Ltd.

Spinney, J. (2009). Cycling the City: Movement, Meaning and Method. *Geography Compass*, **3**(2), 817–835.

Spinney, J. (2011). A chance to catch a breath: using mobile video ethnography in cycling research. *Mobilities*, **6**(2), 161–182.

Spinney, J. (2015). Close encounters? Mobile methods, (post)phenomenology and affect. *Cultural Geographies*, **22**(2), 231–246.

Spinoza, B. de. (1996). *Ethics*. (S. Hampshire & E. Curley, Eds.). London: Penguin Classics.

Stals, S., Smyth, M., & Mival, O. (2018). Capturing, Exploring and Sharing People's Emotional Bond with Places in the City using Emotion Maps. *Airea: Arts and Interdisciplinary Research*, **1**, 47–62.

Stansfeld, S. A., Berglund, B., Clark, C., Lopez-Barrio, I., Fischer, P., Öhrström, E., Haines, M. M., Head, J., Hygge, S., van Kamp, I., & Berry, B. F. (2005). Aircraft and road traffic noise and children's cognition and health: a cross-national study. *Lancet*, **365**(9475), 1942–1949.

Stansfeld, S. A., & Matheson, M. P. (2003). Noise pollution: non-auditory effects on health. *British Medical Bulletin*, **68**(1), 243–257.

Stemmler, G. (2009). Somatoviszerale Aktivierung [Somatovisceral activation]. In B. Niels, F. Dieter, K. Julius, & G. Stemmler (Eds.), *Psychologie der Emotion, Enzyklopädie der Psychologie [Psychology of emotion, encyclopedia of psychology]* (pp. 314–361). Göttingen: Hogrefe.

Steptoe, A., Owen, N., Kunz-Ebrecht, S. R., & Brydon, L. (2004). Loneliness and neuroendocrine, cardiovascular, and inflammatory stress responses in middle-aged men and women. *Psychoneuroendocrinology*, **29**(5), 593–611.

Stern, D. B. (2012). Witnessing across time: accessing the present from the past and the past from the present. *Psychoanalytic Quarterly*, **81**(1), 53–81.

Stoff, D. M., & Cairns, R. B. (2014). *Aggression and violence: Genetic, neurobiological, and biosocial perspectives*. New York, NY: Psychology Press.

Strang, V. (2004). *The Meaning of Water*. Oxford: Berg.

Strang, V., & McLeish, T. (2015). *Evaluating interdisciplinary research: a practical guide*. Durham: Institute of Advanced Study: Durham University.

Strathern, M. (1992). *After Nature English Kinship in the Late Twentieth Century*. Cambridge: Cambridge University Press.

Strauss, A. L. (1987). *Qualitative Analysis for Social Scientists*. Cambridge: Cambridge University Press.

Sui, D., & Goodchild, M. (2011). The convergence of GIS and social media: challenges for GIScience. *International Journal of Geographical Information Science*, **25**(11), 1737–1748.

Sun, R., & Chen, L. (2012). How can urban water bodies be designed for climate adaptation? *Landscape and Urban Planning*, **105**(1–2), 27–33.

Sutton, J. (2006). Introduction: Memory, Embodied Cognition, and the Extended Mind. *Philosophical Psychology*, **19**(3), 281–289.

Swan, M. (2013). The Quantified Self: Fundamental Disruption in Big Data Science and Biological Discovery. *Big Data*, **1**(2), 85–99.

Sweet, E. L., & Ortiz Escalante, S. (2015). Bringing bodies into planning: Visceral methods, fear and gender violence. *Urban Studies*, **52**(10), 1826–1845.

Takaki, A., & Shimotsuma, K. (2003). What is "Living Heritage Site"? In *The ICCROM's Living Heritage Sites Programme First Strategy Meeting,*. Bangkok: ICCROM.

Talen, E. (1999). Sense of community and neighbourhood form: An assessment of the social doctrine of new urbanism. *Urban Studies*, **36**(8), 1361–1379.

Tallis, R. (2011). *Aping Mankind. Neuromania, Darwinitis and the misrepresentation of humanity*. Durham: Acumen.

Tao, J., & Tan, T. (2005). Affective computing: a review. In *International Conference on Affective computing and intelligent interaction* (pp. 981–995). Berlin: Springer.

Tashakkori, A., & Teddlie, C. (2003). *Handbook of Mixed Methods in Social & Behavioral*

Research. Thousand Oaks, CA: SAGE.

Tatler, B. W., Macdonald, R. G., Hamling, T., & Richardson, C. (2016). Looking at Domestic Textiles: An Eye-Tracking Experiment Analysing Influences on Viewing Behaviour at Owlpen Manor. *Textile History*, **47**(1), 94–118.

Taylor, Kathleen. (2012). *The Brain Supremacy: Notes from the Frontiers of Neuroscience*. Oxford: Oxford University Press.

Taylor, Ken. (2008). Landscape and memory. In *The Right to Landscape: Contesting Landscape and Human Rights* (pp. 19–22). Cambridge.

Taylor, N. (2003). The aesthetic experience of traffic in the modern city. *Urban Studies*, **40**(8), 1609–1625.

Taylor, R. R. (1974). *The Word in Stone: The Role of Architecture in the National Socialist Ideology*. Berkeley, CA: University of California Press.

Teddlie, C., & Tashakkori, A. (2003). Major issues and controversies in the use of mixed methods in the social and behavioral sciences. In *Handbook of Mixed Methods in Social & Behavioral Research* (pp. 3–50). Thousand Oaks, CA: SAGE.

Teddlie, C., & Yu, F. (2007). Mixed methods sampling: a typology with examples. *Journal of Mixed Methods Research*, **1**(1), 77–100.

The Chamberlain Highbury Trust. (2018). The Highbury Restoration Project. Retrieved May 27, 2018, from https://chamberlainhighburytrust.co.uk/the-project/

The Gardeners Chronicle. (1884, October). The Gardens at Highbury. *The Gardeners Chronicle: A Weekly Illustrated Journal of Horticulture and Allied Subjects*, 519–520.

The Gardeners Chronicle. (1904, November). Mr. Chamberlain's Garden. *The Gardeners Chronicle: A Weekly Illustrated Journal of Horticulture and Allied Subjects*, 361–369.

Thien, D. (2005). After or beyond feeling? A consideration of affect and emotion in geography. *Area*, **37**(4), 450–454.

Thorne, B. (2007). Editorial: Crafting the interdisciplinary field of childhood studies. *Childhood*, **14**(2), 147–152.

Thrift, N. (1996). *Spatial Formations*. London: SAGE.

Thrift, N. (1997). The still point: resistance, expressive embodiment and dance. In S. Pile & M. Keith (Eds.), *Geographies of Resistance* (pp. 124–151). New York: Routledge.

Thrift, N. (1999). Steps to an Ecology of Place. In D. Massey, J. Allen, & P. Sarre (Eds.), *Human Geography Today* (pp. 295–321). Cambridge: Polity Press.

Thrift, N. (2004). Intensities of Feeling: Towards a Spatial Politics of Affect. *Geografiska Annaler: Series B, Human Geography*, **86**(1), 57–78.

Thrift, N. (2008). *Non-Representational Theory: Space, Politics, Affect*. London: Routledge.

Thrift, N. (2011). Lifeworld Inc—and what to do about it. *Environment and Planning D: Society and Space*, **29**(1), 5 – 26.

Till, K. (2008). Places of Memory. In J. A. Agnew, K. Mitchell, & G. Toal (Eds.), *A Companion to Political Geography* (pp. 289–301). Malden, MA: Blackwell Publishing.

Todd, T. P., & Bucci, D. J. (2015). Retrosplenial Cortex and Long-Term Memory: Molecules to Behavior. *Neural Plasticity*, 1–9.

Toga, A. W. (1996). *Brain mapping methods*. San Diego, CA: Academic Press.

Tolia-Kelly, D. P. (2004). Locating Processes of Identification: Studying the Precipitates of Re-memory through Artefacts in the British Asian Home. *Transactions of the Institute of British Geographers*, **29**(3), 314–329.

Tolia-Kelly, D. P. (2006). Affect - An ethnocentric encounter? Exploring the "universalist" imperative of emotional/affectual geographies. *Area*, **38**, 213–217.

Tolia-Kelly, D. P. (2010). *Landscape, Race and Memory: Material Ecologies of Citizenship*. Oxford: Oxford University Press.

Tolia-Kelly, D. P., Waterton, E., & Watson, S. (2016). *Heritage, Affect and Emotion: Politics, Practices and Infrastructures*. London; New York: Routledge.

Tompkins, K. W. (2016). On the Limits and Promise of New Materialist Philosophy. *Journal of the Cultural Studies Association*, **5**(1), 5-10.

Treadway, M. T., & Lazar, S. W. (2010). Mediation and Neuroplasticity: Using Mindfulness to Change the Brain. In R. Baer (Ed.), *Assessing Mindfulness and Acceptance Processes in Clients: Illuminating the Theory and Practice of Change* (pp. 185–206). Oakland, CA: New Harbinger Publications.

Trigg, D. (2012). *The Memory of Place: A Phenomenology of the Uncanny*. Athens, OH: Ohio University Press.

Tuan, Y.-F. (1976). Humanistic geography. *Annals of the Association of American Geographers*, **66**(2), 266–276.

UK Government. (1990). Planning (Listed Buildings and Conservation Areas) Act 1990. Retrieved November 23, 2015, from http://www.legislation.gov.uk/ukpga/1990/9/pdfs/ukpga_19900009_en.pdf

UK Government. (2019). Living Heritage. Retrieved February 6, 2019, from https://www.parliament.uk/about/living-heritage/

Ulrich, R. S. (1979). Visual landscapes and psychological well-being. *Landscape Research*,

4(1), 17–23.

Ulrich, R. S. (1993). Biophilia, biophobia, and natural landscapes. *The Biophilia Hypothesis*, **7**, 73–137.

Ulrich, R. S., Simons, R. F., Losito, B. D., Fioritom, E., Miles, M. A., & Zelson, M. (1991). Stress recovery during exposure to natural and urban environments. *Journal of Environmental Psychology*, **11**(3), 201–230.

UNESCO. (2005). *Operational Guidelines for the Implementation of World Heritage Convention*. Paris.

UNESCO. (2008). *Operational Guidelines for the Implementation of World Heritage Convention*. Paris.

UNESCO. (2011). Angkor World Heritage Site, Retrived June 15, 2019, from https://whc.unesco.org/en/list/668

UNESCO. (2013). Mobilizing living heritage for sustainable development. Retrieved February 6, 2019, from https://whc.unesco.org/en/news/1085/

UNESCO. (2016). Basic Texts of the 2003 Convention for the Safeguarding of the Intangible Cultural Heritage. Paris: UNESCO.

UNESCO. (2018). Cultural Landscapes. Retrieved November 19, 2018, from https://whc.unesco.org/en/culturallandscape/

University of Birmingham. (2016). Code of Practice for Research. Retrieved May 10, 2017, from http://www.birmingham.ac.uk/Documents/university/legal/research.pdf

Valentine, G. (1989). The Geography of Women's Fear. *Area*, **21**(4), 383–390.

Valentine, G. (2005). Tell me about... using interviews as a research methodology. In R. Flowerdew & M. Dodge (Eds.), *Methods in Human Geography: A guide for students doing a research project* (2nd ed.). London: Pearson Education.

Van den Berg, A. E. (2009). Restorative effects of nature: towards a neurobiological approach. In *Human Diversity: design for life, Proceedings of the 9th International Congress of Physiological Anthropology* (pp. 132–138). Delft, The Netherlands.

Van den Berg, A. E., Maas, J., Verheij, R. A., & Groenewegen, P. P. (2010). Green space as a buffer between stressful life events and health. *Social Science & Medicine*, **70**(8), 1203–1210.

van den Berghe, P. L. (1990). Why most sociologists don't (and won't) think evolutionarily. *Sociological Forum*, **5**(2), 173–185.

Van der Tuin, I., & Dolphijn, R. (2012). *New Materialism: Interviews & Cartographies*. *New Metaphysics*. Open Humanities Press.

van Dijk, J. (2004). Mediated memories: personal cultural memory as object of cultural analysis. *Continuum*, **18**(2), 261–277.

Varela, F. J. (1996). Neurophenomenology: A methodological remedy for the hard problem. *Journal of Consciousness Studies*, **3**(4), 330–349.

Varela, F. J., Thompson, E., & Rosch, E. (1993). *The Embodied Mind: Cognitive science and human experience*. Cambridge, MA: MIT Press.

Varkovetski, M. (2016). The reduction of directed attention fatigue through exposure to visual nature stimuli: Exploring a natural therapy for fatigue. *SURG Journal*, **8**(2), 5–13.

Vertinsky, P. (1990). *The eternally wounded woman: Women, doctors, and exercise in the late nineteenth century*. Manchester: Manchester University Press.

Vertinsky, P. (1998). "Run, Jane, run": Central tensions in the current debate about enhancing women's health through exercise. *Women & Health*, **27**(4), 81–111.

Vicario, L., & Monje, P. M. M. (2003). Another "Guggenheim effect"? The generation of a potentially gentrifiable neighbourhood in Bilbao. *Urban Studies*, **40**(12), 2382–2400.

Vidler, A. (1994). *The Architectural Uncanny: Essays in the Modern Unhomely*. Cambridge, MA: MIT Press.

Völker, S., & Kistemann, T. (2011). The impact of blue space on human health and well-being–Salutogenetic health effects of inland surface waters: A review. *International Journal of Hygiene and Environmental Health*, **214**(6), 449–460.

Völker, S., & Kistemann, T. (2013). "I'm always entirely happy when I'm here!" Urban blue enhancing human health and well-being in Cologne and Düsserldorf, Germany. *Social Science & Medicine*, **78**, 113–124.

Völker, S., & Kistemann, T. (2015). Developing the urban blue: Comparative health responses to blue and green urban open spaces in Germany. *Health & Place*, **35**, 196–205.

Waite, S. (2007). Memories are made of this: some reflections on outdoor learning and recall. *Education 3-13*, **35**(4), 333–347.

Waitt, G., & Phillips, C. (2016). Food waste and domestic refrigeration: a visceral and material approach. *Social & Cultural Geography*, **17**(3), 359–379.

Wakefield, S., Elliott, S. J., Cole, D. C., & Eyles, J. D. (2001). Environmental risk and (re)action: air quality, health and civic involvement in an urban industrial neighbourhood. *Health & Place*, **7**, 163–177.

Walsh, A. (2017). *Biosociology: Bridging the Biology-Sociology Divide*. London:

Routledge.

Wanda George, E. (2010). Intangible cultural heritage, ownership, copyrights, and tourism. In *International Journal of Culture, Tourism and Hospitality Research* (Vol. 4, pp. 376–388).

Wang, C. C., & Redwood-Jones, Y. A. (2001). Photovoice Ethics: Perspectives from Flint Photovoice. *Health Education & Behavior*, **28**(5), 560–572.

Ward, K. J. (2014). Biosocial Becomings By Tim Ingold and Gisli Palsson (Eds.). *Environment and Planning D: Society and Space*. Retrieved on June 15, 2019 from http://societyandspace.org/2014/04/15/biosocial-becomings-integrating-social-and-biological-anthropology-by-tim-ingold-and-gisli-palsson-eds-reviewed-by-kim-j-ward/

Waterton, E., & Watson, S. (2013). Framing theory: towards a critical imagination in heritage studies. *International Journal of Heritage Studies*, **19**(6), 546–561.

Waterton, E., & Watson, S. (2015a). Heritage as a Focus of Research: Past, Present and New Directions. In E. Waterton & S. Watson (Eds.), *The Palgrave Handbook of Contemporary Heritage Research* (pp. 1–20). London: Palgrave Macmillan.

Waterton, E., & Watson, S. (2015b). *The Palgrave Handbook of Contemporary Heritage Research*. Basingstoke: Palgrave Macmillan.

Watkins, A. (1997). Landowners and their Estates in the Forest of Arden in the Fifteenth Century. *The Agricultural History Review*, **45**(1), 18–33.

Watson, S., & Wells, K. (2005). Spaces of nostalgia: the hollowing out of a London market. *Social & Cultural Geography*, **6**(1), 17–30.

Wendt, D. C., & Gone, J. P. (2012). Urban-indigenous therapeutic landscapes: A case study of an urban American Indian health organization. *Health & Place*, **18**(5), 1025–1033.

Wesener, A. (2016). "This place feels authentic": exploring experiences of authenticity of place in relation to the urban built environment in the Jewellery Quarter, Birmingham. *Journal of Urban Design*, **21**(1), 67–83.

Wetherall, M. (2012). *Affect and Emotion: A new social science understanding.* SAGE.

Whelan, Y. (2016). *Heritage, memory and the politics of identity: New perspectives on the cultural landscape*. London: Routledge.

White, M., Smith, A., Humphryes, K., Pahl, S., Snelling, D., & Depledge, M. (2010). Blue Space: The importance of water for preference, affect, and restorativeness rating of natural and built scenes. *Journal of Environmental Psychology*, **30**, 482–493.

Whitehand, J., & Morton, N. J. (2004). Urban morphology and planning: the case of fringe

belts. *Cities*, **21**(4), 275–289.

Wildschut, T., Sedikides, C., Arndt, J., & Routledge, C. (2006). Nostalgia: content, triggers, functions. *Journal of Personality and Social Psychology*, **91**(5), 975.

Williams, Allison. (2002). Changing geographies of care: employing the concept of therapeutic landscapes as a framework in examining home space. *Social Science & Medicine*, **55**(1), 141–154.

Williams, Allison. (2007). *Geographies of health: Therapeutic landscapes*. Aldershot: Ashgate Publishing Ltd.

Williams, Andrew. (2016). Spiritual landscapes of Pentecostal worship, belief, and embodiment in a therapeutic community: New critical perspectives. *Emotion, Space and Society*, **19**, 45–55.

Williams, P. (1984). Gentrification in Britain and Europe. In J. J. Palen & B. London (Eds.), *Gentrification, Displacement and Neighborhood Revitalization* (pp. 205–234). Albany: SUNY.

Williams, Simon J. (2001). *Emotion and Social Theory: Corporeal Reflections on the (Ir)rational*. London: SAGE.

Williams, Simon J. (2010). New developments in neuroscience and medical sociology. In W. C. Cockerham (Ed.), *The New Blackwell Companion to Medical Sociology* (pp. 530–551). Oxford: Wiley-Blackwell.

Williams, Simon J, Birke, L., & Bendelow, G. (2003). Introduction: debating biology. In Simon Johnson Williams, L. Birke, & G. Bendelow (Eds.), *Debating biology: sociological reflections on health, medicine and society* (pp. 1–12). New York, NY: Taylor & Francis.

Wilson, E. (1998). *Neural Geographies: Feminism and the microstructure of cogniton*. New York: Routledge.

Wilson, E. (2004). *Psychosomatic: Feminism and the Neurological Body*. Durham, NC: Duke University Press.

Wilson, E. (2015). *Gut Feminism*. Durham, NC: Duke University Press.

Wilson, H. F. (2011). Passing propinquities in the multicultural city: the everyday encounters of bus passengering. *Environment and Planning A*, **43**(3), 634–649.

Wilson, H. F., & Darling, J. (2016). The possibilities of encounter. In J. Darling & H. F. Wilson (Eds.), *Encountering the city: urban encounters from Accra to New York* (pp. 1–24). New York, NY: Routledge.

Witmore, C. (2005). Four archaeological engagements with place mediating bodily

experience through peripatetic video. *Visual Anthropology Review*, **20**(2), 57–71.

Wittgenstein, L., Anscombe, G. E. M., von Wright, G. H., & Paul, D. (1969). *On Certainty*. Oxford: Blackwell Publishing.

Wright, J. P., & Boisvert, D. (2009). What biosocial criminology offers criminology. *Criminal Justice and Behavior*, **36**(11), 1228–1240.

Yamashita, S. (2002). Perception and evaluatin of water in landscape: use of photo-projective method to compare child and adult resident's perceptions of a Japanese river environment. *Landscape and Urban Planning*, **62**(1), 3–17.

Yang, Y. (2008). A tale of two cities: Physical form and neighborhood satisfaction in metropolitan Portland and Charlotte. *Journal of the American Planning Association*, **74**(3), 307–323.

Yannakakis, G., Hallam, J., & Lund, H. H. (2008). Entertainment capture through heart rate activity in physical interactive playgrounds. *User Modeling and User-Adapted Interaction*, **18**(1), 207–243.

Yin, R. K. (2013). *Case Study Research: Design and methods*. London: SAGE.

Youdell, D. (2016). A biosocial future? *Research in Education*, **96**(1), 52–61.

Youdell, D. (2017). Bioscience and the sociology of education: the case for biosocial education. *British Journal of Sociology of Education*, 1–14.

Youdell, D., & Lindley, M. R. (2018). *Biosocial Education: The Social and Biological Entanglements of Learning*. London: Routledge.

Zeile, P., Resch, B., Exner, J.-P., & Sagl, G. (2015). Urban Emotions: Benefits and Risks in Using Human Sensory Assessment for the Extraction of Contextual Emotion Information in Urban Planning. In S. Geertman, J. Ferreira, R. Goodspeed, & J. C. H. Stillwell (Eds.), *Planning Support Systems amd Smart Cities* (pp. 209–225). Berlin: Springer.

ZGIS. (2016). Urban Emotions: Extracting Contextual Emotion Information for Spatial Planning. Retrieved May 19, 2017, from http://www.zgis.at/index.php/en/research/research-projects/2-uncategorised/144-urban-emotions

Zhao, S. (Nancy), Nyaupane, G. P., & Timothy, D. J. (2016). Resident's preferences for historic preservation criteria and their determinants: an American example. *Journal of Heritage Tourism*, **11**(4), 395–410.

Zhou, X., Sedikides, C., Wildschut, T., & Gao, D.-G. (2008). Counteracting loneliness: On the restorative function of nostalgia. *Psychological Science*, **19**(10), 1023–1029.

APPENDICES

Appendix 1: Collected data and quantities 335
Appendix 2: Participant information 337
Appendix 3: Information and consent form 339
Appendix 4: Participant Question Sheet 341
Appendix 5: Formatting Empatica Data 343
Appendix 6: Creating a master file for ArcGIS 345
Appendix 7: Copy of inView magazine page with recruitment advertisement 347

Appendix 1: Collected data and quantities

Device	Modalities	Measure	Quantity
Biosensing Wristband			9,341,958
	EDA	Microsiemens (μS)	506,587
	BVP	nanoWatt (nW)	8,108,496
	HR	Heart beats/minute (bpm)	126,210
	TEMP	Degrees Celsius (°C)	600,665
GPS			370,356
	Latitude		123,452
	Longitude		123,452
	Altitude		123,452
GoPro	Audio-visual		34hr 25’ 47”
Dictaphone	Audio		26hr 8’ 35’’

Appendix 2: Participant information

Data Code	Pseudonym	Area	Age	Sex	Live/work	Length of time (years)	Data collection date
B101	Rick	Bournville	25-34	M	Live	20+	01/08/2016
B102	Dale	Bournville	18-24	M	Live	16-20	03/08/2016
B103	Alan	Bournville	65+	M	Live	20+	04/08/2016
B104	Barry	Bournville	35-44	M	Live	20+	08/08/2016
B105	Nick	Bournville	45-54	M	Live	20+	07/08/2016
B106	Annie	Bournville	45-54	F	Work	20+	08/08/2016
B107	Julie	Bournville	35-44	F	Live & work	16-20	09/08/2016
B108	Max	Bournville	35-44	M	Work	11-15	09/08/2016
B109	Rachel	Bournville	25-34	F	Live	6-10	10/08/2016
B110	Ben	Bournville	25-34	M	Live	1-5	13/08/2016
B111	Mike	Bournville	25-34	M	Live & work	20+	15/08/2016
B112	Mary	Bournville	55-64	F	Live	16-20	19/08/2016
B113	Joan	Bournville	55-64	F	Live	6-10	04/09/2016
B114	Terence	Bournville	65+	M	Live	20+	27/09/2016
B115	Bob	Bournville	65+	M	Live	6-10	28/09/2016
B116	Jeff	Bournville	55-64	M	Live	20+	04/10/2016
B117	Peggy	Bournville	65+	F	Live	16-20	19/10/2016
B118	Valerie	Bournville	55-64	F	Live	20+	20/10/2016
B119	Dan	Bournville	18-24	M	Live	20+	27/10/2016
B120	Alan	Bournville	55-64	M	Live	<1	10/11/2016
J101	Christina	Jewellery Quarter	35-44	F	Work	1-5	02/08/2016
J102	Monica	Jewellery Quarter	35-44	F	Live	<1	16/08/2016
J103	Karen	Jewellery Quarter	45-54	F	Live & work	20+	17/08/2016
J104	Rebecca	Jewellery Quarter	25-34	F	Work	1-5	18/08/2016
J106	Owen	Jewellery Quarter	25-34	M	Live	1-5	20/08/2016
J107	Martin	Jewellery Quarter	25-34	M	Live	1-5	22/08/2016
J108	Maria	Jewellery Quarter	18-24	F	Live	1-5	23/08/2016
J109	Amanda	Jewellery Quarter	55-64	F	Live & work	6-10	23/08/2016
J110	Ann	Jewellery Quarter	45-54	F	Work	16-20	07/09/2016
J111	Mandy	Jewellery Quarter	35-44	F	Work	1-5	09/09/2016
M101	Sonya	Moseley	45-54	F	Live	20+	25/11/2016
M102	Michelle	Moseley	35-44	F	Live	6-10	28/11/2016
M103	Stephen	Moseley	65+	M	Live	20+	28/11/2016
M104	Glen	Moseley	55-64	M	Live & work	11-15	29/11/2016
M105	Judith	Moseley	65+	F	Live	20+	30/11/2016
M106	Pauline	Moseley	55-64	F	Live	20+	30/11/2016
M107	Emily	Moseley	35-44	F	Live & work	20+	05/12/2016
M108	Matthew	Moseley	45-54	M	Live	20+	05/12/2016
M109	Ed	Moseley	45-54	M	Live	20+	06/12/2016
M110	Esther	Moseley	45-54	F	Live	6-10	07/12/2016

Appendix 3: Information and consent form

UNIVERSITY OF BIRMINGHAM

Information and Consent form

This study seeks to better understand how urban public spaces can shape people's emotional responses and wellbeing. The project will apply geographic and psychological theory in order to particularly focus on how these responses are influenced by the spaces in which they occur and also how they can influence the way that people feel about the spaces themselves.

The research is being undertaken in historical areas of Birmingham, UK, and two methods will be used. The first will be a walk undertaken in the designated area where the participants wear a video camera and biosensing equipment. The non-intrusive biosensing equipment (a wristband) will measure and record the individual's 'emotional' responses to the environment. The video camera will visually capture the 'triggers' that cause that emotional responses and also be used in the second method as an aide. This second part will involve talking to participants who have undertaken a walk with the equipment in order to get their perspectives on the triggers and how they feel in urban conservation areas more generally. It will give them a chance to explain or question the emotional triggers that are raised from method one whilst also raising any issues that they feel are important. The point of the project is to combine these different methods; therefore participation in all of the methods is vital.

I want to stress that your participation in the project is both very useful and greatly appreciated but is entirely voluntary. If you do not wish to be a part of this project, that is your choice and there will be no consequences of this. If at any time during the project, you change your mind about participation for any reason, then that is your choice also. You will be allowed to opt-out of the research and withdraw all your data until the end of fieldwork, which will approximately be May 2017. There will be no consequences for you regarding your decision to do this.

All data gathered, including the video, bio-sensing and interview recordings, will be held securely and anonymously for ten years following the study, following the University of Birmingham's regulations. This is to allow for some data to be shared with other researchers in similar areas. Within this all identifiable faces in the video footage will be blurred. However the physiological will never be shared with anyone but that individual participant. The transcripts of the interview data and video footage may be shared but only with the participant's express written permission to do so.

Please feel free to ask as many further questions as you would like to about the project or about me as the researcher. If you are happy to participate then there is a consent form below. This will be kept in the strictest confidence at all times so that your details remain secure and confidential.

Contact information

Primary Researcher:
Tess Osborne
School of Geography, University of Birmingham

t.c.osborne@pgr.bham.ac.uk

Supervisor:
Dr Phil Jones
School of Geography, University of Birmingham

P.I.Jones@bham.ac.uk

Consent

1. I confirm that I have read and understand the Plain Language Statement for the above study and have had the opportunity to ask questions.
2. I understand that my participation is voluntary and that I am free to withdraw at any time up to May 2017, without giving any reason. I understand that after this date I am still able to withdraw from the study however any information already published may not be able to be removed.
3. I confirm that I return all technology that was leant to me to the primary researcher once the walk is over.
4. I consent to the interview being audio-taped and my physiological readings to be taken.
5. I am aware that transcripts will be made from the audio-tape recording and that these will be returned to me for verification of their accuracy. If there is any aspect of the transcript that I am unhappy with, then I am free to request that part to be removed from the study.
6. I am aware that my physiological data will only be accessible to the researcher and myself if I request it.
7. I am aware that all methods (interview, wearable video and physiological readings) are vital and I agree to partake in all.
8. I understand that my name or any information that may allow me to be identified will not be included anywhere within the project or further academic publications. Instead a pseudonym will be used to identify me.
9. I am aware that the information provided will be stored securely for 10 years following the study so that it may be shared with other researchers. I am also aware however that no information will be shared without my express written permission.

I agree to take part in the above study.

Name of Participant	**Date**	**Signature**
Researcher	**Date**	**Signature**

Appendix 4: Participant Question Sheet

ID: _____
Area: _____

UNIVERSITY OF BIRMINGHAM

These questions are designed to help interpret the bio-sensing data. Your name or any information that may allow you to be identified will not be included anywhere within the project or further academic publications. Tick the appropriate box in each case.

Age

☐ 18-24 ☐ 25-34 ☐ 35-44 ☐ 45-54 ☐ 55-64 ☐ 65+

Gender

☐ Male ☐ Female ☐ Other

Link with the area

☐ Live ☐ Work ☐ Other: _____.

And for how long?

☐ < 1 year ☐ 1-5 years ☐ 6-10 years ☐ 11-15 years ☐ 16-20 years ☐ > 20 years

Do you have any of the following medical conditions associated to:

☐ Heart ☐ Skin If so, what conditon _____.

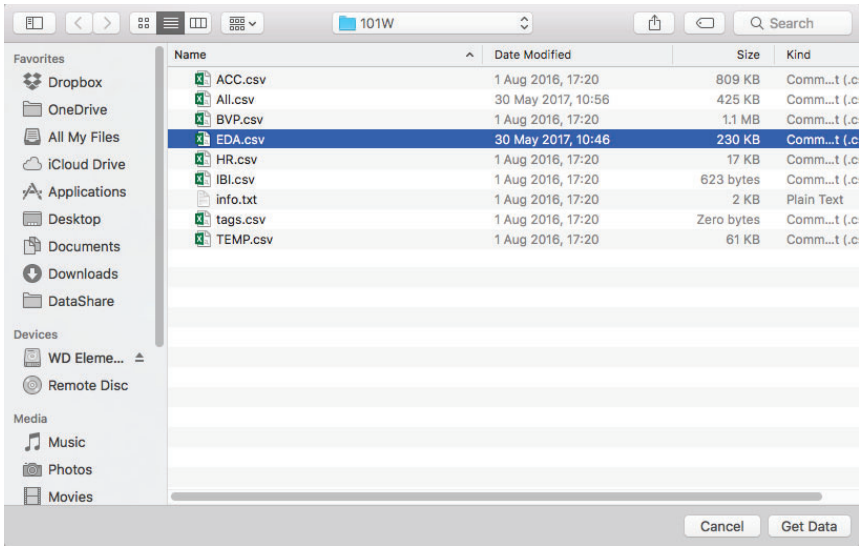
Favourite place in the area

_____, and why _____
_____
_____
_____
_____

Appendix 5: Formatting Empatica Data

1. Create new *Excel* workbook for each participant (ALL.*xlsx*) in the Empatica download folder.
2. Create 5 new sheets within the workbook titled: *ALL*, *BVP, EDA, HR, TEMP.*

3. Input all the raw data from the downloaded Empatica zip file (the files should be called BVP.csv, EDA.csv, HR.csv, and TEMP.csv.
    a. Click 'From Text' on the Data tab.
    b. Navigate to the correct file and click 'Get Data'.



    c. Import the data into cell starting A1.
    d. Repeat for all measures.
4. Input the following formulas:
    a. In cell B3: =(A1/86400)+25569
    b. In cell B4: =B3+0.0000115740740740741/A2
        i. Then drag the formula in B4 to the bottom of the dataset.
    c. Repeat for all measures.
5. Remove all formulas.
    a. Select all and Copy.
    b. Paste special: Paste values.
6. Convert the Epoch timestamp (a remove date information).
    a. In 4C input the formula: =TIME(HOUR(B4),MINUTE(B4),SECOND(B4)
    b. Drag the formula in B4 to the bottom of the dataset.
    c. Repeat for all measures.
7. Remove all formulas.
8. Copy and paste Column C from *EDA* sheet on Column A on the *ALL* sheet.
9. Match raw data with timestamps.
    a. In B3 input the following formula: =LOOKUP(A3,BVP!C:C,BVP!A:A)

b. In C3: =LOOKUP(A3,EDA!C:C,EDA!A:A)
c. In D3: =LOOKUP(A3,HR!C:C,HR!A:A)
d. IN E3: =LOOKUP(A3,TEMP!C:C,TEMP!A:A)

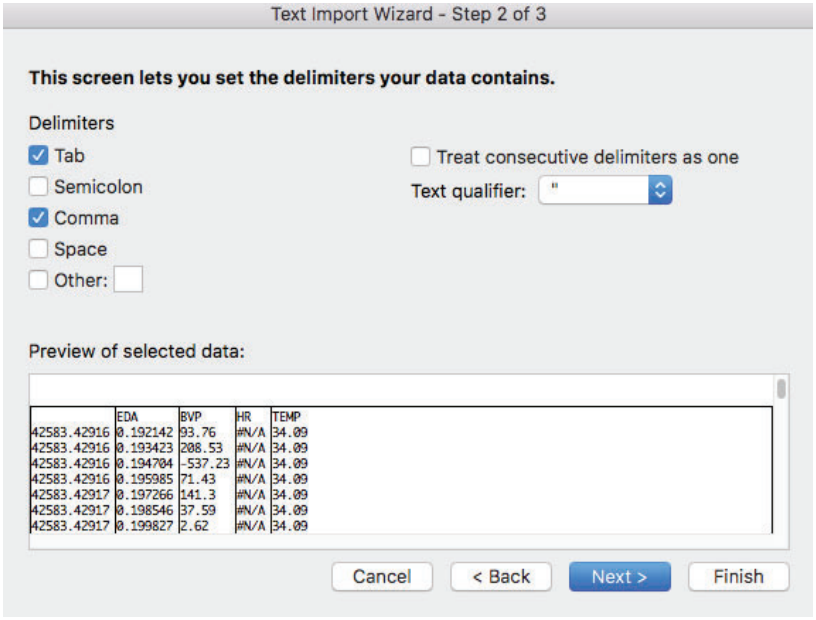
[Note: It is possible that *#N/A* will appear in some cells – this is where there is not data available for that specific time in that measure]

10. Drag formulas in cells A-D3 to the bottom of the dataset and remove all formulas.
11. Save as both *.xlsx* and *.csv* files.

Appendix 6: Creating a master file for ArcGIS

1. Create new *Excel* workbook for each participant (*###.xlsx*) in the Participant's data folder.
2. Create 3 new sheets within the workbook titled: *ALL, GPS, BIO.*
    a. 

3. On the BIO sheet input the .csv file produced in Appendix 5.
    a. Click 'From Text' on the Data tab.
    b. Navigate to the correct file and click 'Get Data'.
    c. Select *Delimited* and set delimiters as *Comma.*



    d. Import the data into cell starting A1.
4. Convert the GPS raw data file (.gpx) to a plain text file (.txt).
    a. Use an online convertor such as http://www.gpsvisualizer.com/
5. On the GPS sheet input the GPS plain text file
    a. Import the data into cell starting A1.
    b. Delimitate using tabs.
    c. Remove contents of all columns except *time*, *latitude*, *longitude*, and *altitude.*
6. Create matching timestamps.
    a. Create a new column to the left of *time.*
    b. In A2 input the formula: =TIME(HOUR(B2),MINUTE(B2),SECOND(B2))

    c. Drag the formula in A2 to the bottom of the dataset.
7. Remove all formulas.
8. Copy Column A from *GPS* sheet and paste in Column A on the *ALL* sheet.
9. Label the columns with the respected data sets: Time, *latitude*, *longitude*, *altitude, BVP, EDA, HR,* and *TEMP*

a.

	A	B	C	D	E	F	G	H	I
1	TIME	Latitude	Longitude	Altitude	BVP	EDA	HR	TEMP	
2	10:17 am								
3	10:17 am								
4	10:17 am								
5	10:17 am								
6	10:17 am								
7	10:17 am								
8	10:17 am								

10. Input the following look up formulas:
    a. B2: =LOOKUP(A2,GPS!A:A,GPS!C:C)
    b. C2: =LOOKUP(A2,GPS!A:A,GPS!D:D)
    c. D2: =LOOKUP(A2,GPS!A:A,GPS!E:E)
    d. E2: =LOOKUP(A2,BIO!A:A,BIO!B:B)
    e. F2: =LOOKUP(A2,BIO!A:A,BIO!C:C)
    f. G2: =LOOKUP(A2,BIO!A:A,BIO!D:D)
    g. H2: =LOOKUP(A2,BIO!A:A,BIO!E:E)
        i. Drag formulas in Cells B2-E2 to bottom of data set and remove formulas.
11. Tidy up the data set
    a. Remove all rows at the top of the data set where the biodata is displayed as *#N/A* – this is where no biodata was recorded for those co-ordinates:

E.g.

	A	B	C	D	E	F	G	H	I
1	TIME	Latitude	Longitude	Altitude	BVP	EDA	HR	TEMP	
2	10:17 am	52.4296844	-1.9351472	158.3	#N/A	#N/A	#N/A	#N/A	
3	10:17 am	52.4296787	-1.9351443	157.3	#N/A	#N/A	#N/A	#N/A	
4	10:17 am	52.4296597	-1.9350974	152	#N/A	#N/A	#N/A	#N/A	
5	10:17 am	52.429657	-1.9350843	150.6	#N/A	#N/A	#N/A	#N/A	
6	10:17 am	52.4296566	-1.9350693	151.1	#N/A	#N/A	#N/A	#N/A	
7	10:17 am	52.4296565	-1.9350576	151.5	#N/A	#N/A	#N/A	#N/A	
8	10:17 am	52.4296566	-1.9350492	151.5	#N/A	#N/A	#N/A	#N/A	
9	10:17 am	52.429656	-1.9350399	151.5	#N/A	#N/A	#N/A	#N/A	
10	10:17 am	52.4296559	-1.9350315	151.5	#N/A	#N/A	#N/A	#N/A	
11	10:17 am	52.4296555	-1.9350244	151.1	#N/A	#N/A	#N/A	#N/A	
12	10:17 am	52.4296538	-1.9350194	151.5	#N/A	#N/A	#N/A	#N/A	

    b. At the bottom of the dataset there will be repeated values for the biodata for the same reason – remove these rows too.

E.g.

	A	B	C	D	E	F	G	H	I
2585	11:00 am	52.4296671	-1.9351595	142.4	22.14	1.438937	88.48	22.73	
2586	11:00 am	52.4296669	-1.9351647	142.4	22.14	1.438937	88.48	22.73	
2587	11:00 am	52.4296609	-1.9351741	142.4	22.14	1.438937	88.48	22.73	
2588	11:00 am	52.4296621	-1.9351757	142.4	22.14	1.438937	88.48	22.73	
2589	11:00 am	52.429661	-1.9351782	142.9	22.14	1.438937	88.48	22.73	
2590	11:00 am	52.4296615	-1.9351778	142.9	22.14	1.438937	88.48	22.73	
2591	11:00 am	52.4296616	-1.9351773	142.9	22.14	1.438937	88.48	22.73	
2592	11:00 am	52.4296621	-1.9351768	142.9	22.14	1.438937	88.48	22.73	
2593	11:00 am	52.4296616	-1.9351763	142.9	22.14	1.438937	88.48	22.73	
2594	11:00 am	52.429661	-1.9351761	142.9	22.14	1.438937	88.48	22.73	
2595	11:00 am	52.4296605	-1.9351758	142.9	22.14	1.438937	88.48	22.73	
2596	11:00 am	52.42966	-1.9351756	142.9	22.14	1.438937	88.48	22.73	
2597	11:00 am	52.4296599	-1.9351754	142.9	22.14	1.438937	88.48	22.73	
2598	11:00 am	52.42966	-1.9351783	142.9	22.14	1.438937	88.48	22.73	

12. Save as both *.xlsx* and *.csv* files.

Appendix 7: Copy of inView magazine page with recruitment advertisement

MESSAGE FROM THE EDITOR

Hello and welcome to the autumn issue of inView, your four-times-a-year newsletter from BVT.

It's been a busy summer at BVT with events and activities held across communities in Birmingham and Telford for you and your family.

If you attended one of our events, we hope you enjoyed it and, if you turn to page 7, you might even spot yourself in our 'summer snaps' picture special.

If photography is your thing, you may also appreciate the snaps on page 3 from Bournville's inaugural open gardens event, part of the National Gardens Scheme.

The event raised a tremendous amount of money for charity and we'd like to thank everyone who opened their gardens to the public and indeed all the visitors.

Talking of visitors, Shenley Court Hall in Selly Oak is a popular community hall that hosts an exciting weekly programme of events and activities.

If you've never been, why not pop along and find out more about what's on offer.

The Hall also has a fantastic music studio where bands and solo performers can perform, record and mix. For October, the Studio is offering a special 'buy one, get one free' promotion for new bookings. To find out more, turn to page 6.

Also in this issue is a special double page feature on anti-social behaviour (ASB), which you'll find on pages 8-9.

ASB can have a huge impact, not just on individuals, but whole communities and this special feature explains what we can do to help you if you're experiencing it.

Lastly, if you enjoy reading this newsletter, or keeping up to date with our news on Facebook, maybe you'd like to join our Communications Forum.

For details on joining the Forum or if you have any feedback on this issue, or a story to share, you can email me at clairemorrall@bvt.org.uk or call 0300 333 6540. Happy reading!

A word from the Chief Executive

It is hard to believe that it has been nearly a year since the first part of Bournville's care village, College Green opened.

Bournville Gardens, managed by the ExtraCare Charitable Trust, is now home to 300 people and is very much a flourishing community in its own right.

Since it opened, I have visited the retirement village many times and the feedback I have heard from residents never fails to impress me.

For some, moving into Bournville Gardens has been a life changing experience – giving residents a new lease of life, helping them to make new friends or simply supporting people to live in a more comfortable home.

The impact of good quality housing to people's health and wellbeing should never be underestimated and we are very pleased that planning permission has been granted to build a further 16 ExtraCare Charitable Trust homes at College Green. You can read more about this on page 3.

Despite government changes, including rent reductions which have significantly reduced our funding, we are still committed to continuing to invest in our homes.

Over the last year, we have carried out hundreds of improvements to BVT rented homes as part of our planned maintenance programmes.

Satisfaction with our day-to-day and planned repairs continues to be high, as you will see in our latest annual review, which will soon be available to read on our website.

Lastly, I would like to reflect on the work of BVT resident and solar energy pioneer, Dr Leslie Frank Jesch, who recently passed away. Dr Jesch was instrumental in the research and monitoring of energy efficient homes in and around Oak Farm Road, known as Rowheath Solar Village.

This work was revolutionary at the time and very much paved the way for the use of solar energy elsewhere in Bournville, namely at homes in Lower Shenley.

The Trust pays tribute to Dr Jesch and the significance of his work at the Solar Village which continues to be valued by both his neighbours and BVT.

Peter Roach

MAILBAG

Dear Editor,

I am a Doctorial Researcher at the University of Birmingham, currently undertaking a PhD on neuroscientific methods and urban heritage.

I am planning, with participants wearing a bio-sensing wristband, to undertake a walk around areas of preserved heritage to see how people emotionally perceive the environment.

I am particularly keen to use Bournville as a case area and am looking for individuals to take a walk around the area and be interviewed by me afterwards.

I would be grateful to hear from anyone who would be interested in participating in the walk by the end of September.

You can email me at t.c.osborne@pgr.bham.ac.uk or by telephone at

Ms Tess Osborne, Bournville