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HOW THEN *COULD* WE LIVE?
TOWARDS THE PRAGMATIC CREATION OF
SUSTAINABLE ECOLOGICAL HABITUS IN CITIES

**A dissertation presented in partial fulfilment of the
requirements for the degree of**

**Doctor of Philosophy
in
Environmental Management**

**at Massey University, Manawatū,
New Zealand**

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2018

You see things; and you say ‘Why?’

But I dream things that never were; and I say, ‘Why not?’

—George Barnard Shaw, *Back to Methuselah*

ABSTRACT

Creating ecologically sustainable ways of life is desirable, necessary, and urgent for the collective future of life on Earth. Although this is acknowledged, aspired to, and increasingly pursued in action, broad-scale sustainability remains unrealised. Western cities offer a strategic place to exemplify and accelerate global sustainability transitions. Such cities are characterised by dense human populations with excessive per capita resource use, but they can also be cornucopias of economic development, progressive politics, and diverse culture and correspondingly act at global hotspots of innovation and change.

This exploratory research proposes pragmatic backcasted pathways for furthering such change, constructing future visions of more sustainable ways of life in Western cities, identifying present-day barriers to realising these, and generating practical solutions ‘here and now’ that could contribute strategically to overcoming the barriers, towards a sustainable future. An insight and foresight rich distillation of evidence-based knowledge and practical experience was generated to inform these pathways, through qualitative interviews with 25 esteemed experts specialising in fields of socio-ecology and cities, including planning, design, sociology, psychology, philosophy, art, activism, economics, and government.

To analyse this data and conceptualise alternative pathways, ‘ecological habitus’, an emergent socio-ecological theory, was developed and employed as a practical framework for conceptually linking broad-scale socio-ecological issues with everyday practice; analysing the inter-dependent variables (e.g. normative, material, social, and psychological) of social reproduction and change; and assessing their sustainability at different scales (e.g. individual and institutional). Two components were added to the theory: ‘natural capital’ (the ecological/biophysical factors within socio-ecological relationships), and ‘ecological reflexivity’ (people’s responses to natural capital whether intentional-critical, periodic-conscious, or routine-subconscious). These enhance ecological habitus as a versatile tool for socio-ecological and sustainability-transition research.

The ultimate research outcomes are three backcasted pathways towards a future of ‘sustainable ecological habitus’, which could begin pragmatically with: collaborative practice among city authorities to develop as ecologically-reflexive sustainability leaders and overcome disciplinary silos; strategic enrichment of cities with accessible, place-based natural capital to enhance human-nature connection; and everyday self-, or socially-directed sustainability micro-interventions among city-dwellers, to incrementally grow mainstream sustainable ecological habitus. These actions combined could accelerate sustainable ecological habitus in Western cities and beyond. The power is ours.

ACKNOWLEDGEMENTS

Ko te mea tuatahi, ko te mihi ki te Ao Mārama, ki a Papatūānuku, ki a Ranginui, ki te wao nui a Tāne, ki ngā aumoana a Tangaroa, ki ngā maunga, ngā awa, ngā tuaone, ngā whetū i tīrama ki runga rā, me ngā wāhi whakamīharo katoa. Nā reira kua puta mai tātou, ō tātou tinana, ō tatou hinengaro, ō tātou wairua, me ngā tini tamariki anō hoki o te ao. Whaihoki, ko ēnei ngā wāhi e puta ana mai te oranga ki roto i a tātou, i ia rā, i ia rā.

To my parents Annetta and Michael, and my Grandma Hilde, thank you for showing me how to wonder in the beginning, and along with Finn and Rose, thank you for wondering (and wandering) with me throughout. Thanks also to Monty and Brom for your exemplary joy. You all make the very best kind of whānau.

To my supervisors in order of acquisition,

John Holland, thank you for helping me to start off on this ambitious endeavour with your contagious enthusiasm and the expectation that I would leap successfully beyond my comfort zone. Thank you for sharing your diagrams, daydreams, and blackboard space with me along the way, and for the many discussions (with good humour and good coffee) that inspired me to keep finding ways to move forward.

Trisia Farrelly, thank you for your conceptualisations, challenges, and attention to detail, especially when reviewing some of my drafts; for kindly inviting me to join in academic forums; and for your early advice about interviewing.

Peter Howland, thank you for meeting me between our divergent understandings, especially in the beginning; for sincerely sharing your intellect and admirable critical reflexivity with me; and for your open-mindedness, patience, and integrity throughout many conceptual challenges and changes. Thanks for your inspiring insight about growing as a scholar and as a writer. Finally, thank you for gifting me your time with such generosity, and for your enduring moral support.

Bob Stewart, thank you for your down-to-earth approach, fresh perspectives, and facilitation pre-exam.

My deepest gratitude to the 25 knowledgeable and generous experts who gave me whole new ways of thinking about the world. Aryne Sheppard, Barbara Deutsch, Beverly Sandalack, Blake Poland, Bruce Morito, Clark Wilson, David Beach, Debbie Kasper, Ellen Dunham-Jones, Greg Searle, Ingrid Stefanovic, Janice Perlman, Juliet Schor, Kristen Miller, Margie Ruddick, Mia Lehrer, P. Wesley Schultz, Randy Haluza-DeLay, Richard Louv, Richard Register, Robert Costanza, Susan Clayton, Stephen Kellert, Timothy Beatley, and Walter J. Hood, thank you all for

your passion, candour, support, advice, and hospitality. Special thanks and in memory of Stephen Kellert, whose input and kind counsel will remain invaluable to me.

For the countless late night chats, laughs, strategy sessions, nature walks, and coffee dates that kept me (relatively) sane, thank you to Rachel and Toby, Patrick, Sandeep, Ketan, Felix, Chloe, Hollie, Nicole, Sara, Léa, Devshree, and my many other valued friends, family, flatmates, and fellow festivalers.

Thank you to Patricia and Kirsten for setting me on my way; to Betty, Andy and Debbie, Richard, Maria, and Amy Z., for hosting me on my travels; and to Chris and Zeus M., Sasha, Jason, the Space crew, Karen and Lyall, Joyanne, and John and Jo (and Louis and Zeus B.), for lending me your places to work upon my return.

Sincere appreciation to my occupational managers Phil, Tracy, Kirstine, Pauline, Jenny, Chris, and Rick, thank you for your support and understanding. Thanks also to Daniela for your (thoroughly enjoyable) sponsorship and down-to-earth advice.

Cheers to all of my Massey contemporaries and fellow comrades-in-struggle and academic-delight. Best of luck especially to my office mates Sriyan, Emily, Tim, Jimmy, and Charlotte, and my admired colleagues Amy P., Ackim, and Jerry.

Thanks to Marion MacKay, Joanna Ross, and Janet Stephenson for your early advice; to Nick Roskrige for your thoughtful input; to Tracy Riley, Peter Kemp, and Kerry Howe for your facilitation at the end; and to John Pahina and Nicky Rees for your much needed support and wisdom.

Finally, my acknowledgements to Massey University for supporting my research with scholarship funding.

Ngā mihi nui ki a koutou katoa.

TABLE OF CONTENTS

Abstract	v
Acknowledgements	vi
Table of Contents	viii
List of Appendices	xiii
List of Figures	xiii
List of Tables	xiv

CHAPTER 1 INTRODUCTION	1
-------------------------------	----------

1.1 Background	3
1.1.1 Global sustainability	3
1.1.2 Global urbanisation	5
1.1.3 Ecological impact of Western cities	7
1.1.4 Defining the city	8
1.1.5 Agglomeration value of cities	9
1.1.6 Cities as day-to-day socio-ecological interfaces	10
1.1.7 Cities as units of change towards sustainability	11
1.1.8 Sustainable cities: definition, examples, and competitive advantage	12
1.1.9 Challenges, aspirations, and everyday practice in 21 st century cities	14
1.2 Problem statement	16
1.3 Aim	16
1.4 Objectives	16
1.5 Limitations of research approach	17
1.6 Content and structural features of the thesis	18
1.6.1 Interdisciplinary content and language of the thesis	18
1.6.2 Manuscripts within the thesis	19
1.7 Statement of authorship	19
1.8 Outline of thesis structure	20

<u>PART I: RESEARCH APPROACH</u>	22
---	-----------

CHAPTER 2 THEORY REVIEW	23
--------------------------------	-----------

2.1 Introduction	23
2.2 Review of Bourdieu's 'habitus'	24
2.2.1 Background on Bourdieu's research approach	25
2.2.2 Habitus, field, capitals, and practice	26
2.2.3 Flexibility and durability in habitus	30
2.3 Building on Bourdieu: contemporary habitus and reflexivity	35
2.4 Definition and use of 'reflexivity' in this thesis	37
2.5 Review of 'ecological habitus'	40

2.5.1	General background of ecological habitus	40
2.5.2	Haluza-DeLay's place-based ecological habitus and supportive social fields	41
2.5.3	Karol and Gale's 'habitus of sustainability' and 'environmental capital'	46
2.5.4	Kasper's conceptual/methodological ecological habitus	48
2.5.5	Gäbler's ecological habitus, transformation, and everyday practice	50
2.6	Conclusions	51
 CHAPTER 3 METHODOLOGY		53
3.1	Introduction	53
3.2	Overview of research approach	53
3.2.1	Overview of backcasting and dissensus Delphi approaches	54
3.2.2	Overview of expert interviews	54
3.2.3	Overview of data analysis	55
3.2.4	Overview of thematising with ecological habitus	56
3.3	Qualitative expert interviews	58
3.3.1	Qualitative interviews as environmental management research tools	58
3.3.2	Expert interviews: definition and characteristics	60
3.3.3	Pros and cons of expert interviews	63
3.4	Conclusions	74
 CHAPTER 4 INTERVIEW METHOD		77
4.1	Introduction	77
4.2	Expert interview planning and design	77
4.2.1	Scope of literature review	77
4.2.2	Concept mapping	79
4.2.3	Expert participant selection strategy	82
4.2.4	Design of interview guide	86
4.2.5	Pilot interviews	88
4.2.6	Ethical approval	88
4.3	Expert interview procedure	89
4.3.1	Initial contact, priming, and logistics	89
4.3.2	Face-to-face interview preliminaries	90
4.3.3	Audio recording protocol	91
4.3.4	Application of interview guide within face-to-face interviews	91
4.3.5	Telephone and email interviews	92
4.3.6	Exiting the interview	92
4.4	Conclusions	93
 CHAPTER 5 ANALYSIS METHOD		95
5.1	Introduction	95
5.2	Methodology and method of transcription	95
5.3	Methodology of coding and beyond	98
5.4	Method of coding	100

5.4.1	Data coding, creating a conceptual network, and identifying key topics	100
5.5	Method of thematising	105
5.5.1	Early thematising and use of matrix for cross-checking data	105
5.5.2	Thematising with an ecological habitus framework	106
5.5.3	Final thematising: from descriptive interim topics to backcasted pathways	112
5.6	Verification of interview analysis outcomes	114
5.6.1	Topical literature reviews within grounded theory and constructive futures research	115
5.7	Organisation of final research outcomes within Part II of the thesis	116
5.8	Conclusions	118

PART II: RESEARCH OUTCOMES **121**

CHAPTER 6 ECOLOGICAL HABITUS AS AN ASPIRATION, DESCRIPTOR, AND FRAMEWORK **123**

6.1	Introduction	123
6.2	Aspirational ‘sustainable ecological habitus’	124
6.3	‘Ecological habitus’ as a neutral descriptor and lens	126
6.4	Developing ecological habitus as a framework	128
6.4.1	Modelling cyclical change in habitus	130
6.4.2	Applying the cyclic model of habitus during data analysis	134
6.4.3	Adding natural capital as a tenet of ecological habitus	135
6.4.4	My proposed ‘ecological habitus framework’ for change	136
6.5	Applying the ecological habitus framework within my research	139
6.5.1	My emphasis on pragmatism and practice	140
6.5.2	My use and development of ecological reflexivity	143
6.6	Conclusions	145

CHAPTER 7 ECOLOGICAL REFLEXIVITY AS A SOCIO-ECOLOGICAL RESEARCH TOOL **149**

Abstract		149
7.1	Introduction	149
7.2	Topical Literature review	151
7.2.1	Sociological reflexivity	154
7.2.2	Bourdieu’s habitus-defined reflexivity and its modern developments	155
7.2.3	Ecological habitus and reflexivity	156
7.3	Research approach	157
7.4	Method	157
7.5	Results and discussion	158
7.5.1	What is ecological reflexivity?	158
7.5.2	Mapping out ecological habitus with critER	162
7.5.3	Ecological habitus as a lens for critER research: an example	165
7.6	Conclusions and recommendations for future research	169

CHAPTER 8 SUSTAINABLE CITY LEADERSHIP AMIDST DISCIPLINARY SILOS	171
Abstract	171
8.1 Introduction	172
8.2 Method	174
8.3 Results	175
8.3.1 The aspiration: authorities as leaders towards sustainable cities	175
8.3.2 Desirable sustainable city leadership traits	177
8.3.3 The barrier: disciplinary silos	180
8.3.4 The solution: collaboration	183
8.4 Topical literature review	185
8.4.1 The role of city authorities as sustainability leaders	186
8.4.2 Desirable features in sustainable city leaders	187
8.4.3 Disciplinary and institutional silos	189
8.4.4 Collaboration as a practical circuit breaker	191
8.5 Theory review	192
8.6 Discussion	193
8.6.1 Leadership towards 'sustainable ecological habitus' in cities	193
8.6.2 The ecological habitus of institutional disciplinary-silos	195
8.6.3 Collaboration as a practical silo circuit breaker	197
8.7 Recommendations for future research	201
8.8 Conclusions	202
 CHAPTER 9 GROWING SUSTAINABLE ECOLOGICAL HABITUS WITH NATURE IN THE CITY	 205
Abstract	205
9.1 Introduction	205
9.2 Method	208
9.3 Results	208
9.3.1 Infusing cities with nature: One sustainability solution for cities	209
9.3.2 Connectivity of/to nature in cities	210
9.3.3 Quantity and qualities of nature in cities	212
9.3.4 Childhood and other socialised nature connection	215
9.3.5 Nature and the future	217
9.4 Topical literature review	218
9.4.1 Ecological economics	218
9.4.2 Inherent nature values	221
9.5 Theory review and development	225
9.5.1 Natural capital and ecological capital as core components of ecological habitus	226
9.6 Discussion	229
9.6.1 'Catching' sustainable ecological habitus from nature in cities	229
9.6.2 How to enrich cities with nature	231
9.6.3 Who could grow sustainable ecological habitus with nature in the city	232
9.7 Conclusions and recommendations	233

CHAPTER 10 SMALL ECOLOGICAL ACTIONS TOWARDS MAINSTREAM SUSTAINABILITY IN CITIES	237
Abstract	237
10.1 Introduction	238
10.2 Method	241
10.3 Results	241
10.4 Topical literature review	245
10.4.1 Existing approaches to sustainability	245
10.4.2 Limitations to sustainability engagement	246
10.4.3 How can sustainability become stickier?	248
10.5 Theory review	251
10.6 Discussion	253
10.6.1 'Normal' habitus: the sustainability field vs. the city mainstream	253
10.6.2 Starting smaller to change what is 'normal': SEAs for mainstream fields	254
10.7 Conclusions and recommendations	263
CHAPTER 11 CONCLUSIONS AND RECOMMENDATIONS	267
11.1 Introduction	267
11.2 Uniting literature from diverse disciplines	267
11.3 Generating expert insight and foresight through qualitative interviews	269
11.4 Developing ecological habitus as a framework for analysis and pragmatic change	271
11.5 Towards the pragmatic creation of sustainable ecological habitus in cities	275
11.6 Recommendations for future research	280
11.7 Closing statement	283
REFERENCES	

List of Appendices

- Appendix 1: Examples from my own ecological habitus
- Appendix 2: Supplementary epistemology and methodology
- Appendix 3: Growing critical reflexivity: reflections on my research methodology
- Appendix 4: Proposed field research itinerary showing shortlist of 32 experts
- Appendix 5: Interview guide template
- Appendix 6: Information sheet
- Appendix 7: Participant consent form
- Appendix 8: List of exemplar questions for experts' reference before the interview
- Appendix 9: Email interview: instructions, attachment, and questions
- Appendix 10: Examples of data codes
- Appendix 11: Example of early loose analysis outline
- Appendix 12: Matrix summarising experts' responses to interview questions
- Appendix 13: Examples of experts' ideas about change
- Appendix 14: Table summarising three backcasted pathways
- Appendix 15: List of questions to prompt critical ecological reflexivity (critER)
- Appendix 16: List of pragmatic ideas for improving collaboration
- Appendix 17: List of methods for increasing the quantity and quality of nature in cities

List of Figures

- | | |
|--|-----|
| Figure 1: Photographic montage showing spectrum of landscapes from rural/low density to urban/high density. | 6 |
| Figure 2: Cyclic diagram showing the individual dispositions and social fields that co-construct one another and constitute habitus. | 26 |
| Figure 3: Conceptual map showing four domains of reviewed literature. | 80 |
| Figure 4: Photograph showing individual sticky-notes used in primary coding. | 101 |
| Figure 5: Photograph showing the sticky-note network stage of analysis. | 101 |
| Figure 6: Chronological diagram of analysis. | 107 |
| Figure 7: Simplified diagram showing chronology of analysis (left) and how this translates into the structure and presentation order of thesis Part II (right) – double ended arrows show links between theory and topical themes. | 117 |
| Figure 8: Kasper's model of ecological habitus, with example. | 127 |
| Figure 9: Cyclic model of habitus depicting the potential for reproduction and change in each element. | 131 |
| Figure 10: Cyclic model of ecological habitus depicting natural and ecological capitals. | 137 |

Figure 11: Cyclic model emphasising the pragmatic backbone for creating change in ecological habitus.	142
Figure 12: Model showing the cyclic flow-through of dispositions, practices, social fields and capitals of an existing habitus.	165
Figure 13: Model of disciplinarily-siloed habitus in city institutions.	196
Figure 14: Model showing how intentional adoption of collaborative practice can feed into the development of interdisciplinary and critically ecologically reflexive capitals and dispositions in individual city authorities.	197
Figure 15: Model showing dispositions, practices, fields, and capitals of an aspirational interdisciplinary ecological habitus in city institutions.	200
Figure 16: Model showing how enrichment of cities with nature would enhance natural capital and ecosystem services in cities.	230
Figure 17: Model showing how SEAs could become incorporated into ecological habitus over time.	261
Figure 18: Cyclic model of ecological habitus depicting how change along the three pragmatic pathways could collectively strengthen the backbone of sustainable ecological habitus in cities.	276

List of Tables

Table 1: Examples of what makes a sustainable city.	13
Table 2: List of search terms used in primary literature review.	78
Table 3: Summary of my conceptualisations before the first literature review.	80
Table 4: List of 25 interviewed experts and their roles circa 2012.	85
Table 5: Ten main interview questions.	86
Table 6: Interim outcomes of the analysis process.	104
Table 7: Three major backcasted pathways to sustainability and the interim topics incorporated directly into these.	111
Table 8: Comparison of Bourdieuan habitus and reflexivity with my conceptualisation of ecological habitus and ecological reflexivity.	144
Table 9: List of key questions about ecological habitus (informed by Bourdieu's habitus) to prompt critical ecological reflexivity.	163
Table 10: Collaborative and/or ecologically reflexive ways to examine disciplinary ecological habitus, as informed by the expert interviews.	199
Table 11: Small ecological actions (SEA) inventory exemplar.	256

Chapter 1

INTRODUCTION

A lot of hand-wringing goes on in university ecology departments – something I found during my time as an undergraduate. Ecologists know that we humans are the major cause of environmental degradation worldwide, and that the planet is nearing thresholds of climatic change, biodiversity loss, pollution, and other crises that are forecasted to transform our lives irredeemably. Yet most of humanity seems to be continuing with business as usual and eroding our planetary foundations wholesale, or equally, by degrees.

I suspect that others contemplate the same kinds of questions I did when I began this research journey, such as ‘Why don’t we change the way we do things?’ and ‘What has to happen for us to change our collective course?’ Many argue that a catastrophic ecological or economic collapse will have to happen before we finally figure it out. Yet, ever the optimist, I imagined that there must be better alternatives. Also a relentless pragmatist, I set out to find what some of these alternatives could be.

With the assumption that current ways of life, and specifically those favoured in Western cities, cannot persist if we seek any semblance of a secure and prosperous planetary future, my major research question asked simply ‘How then *could* we live?’ I sought ways to address this question from across disciplines, not wanting to restrict my outlook to narrow or singular disciplinary confines. The way that I ultimately selected to achieve this was to synthesise knowledge from a diverse assemblage of world-leading experts, who had been working, thinking, and acting to solve such problems for much of their respective careers.

Before I knew it, I had departed New Zealand for the first time, flown across the Pacific, and landed in Columbus, Ohio to begin an intensive four-month quest across North America¹ to interview an ambitious list of experts. I had compiled this list from my reviews of relevant literature, and in tracking down the experts I effectively criss-crossed the western, eastern, and northern bounds of the United States, and traversed Canada along the way.

1. Focusing on North American experts was a strategic decision, based on my early literature review and resultant shortlist of 106 experts. This showed that focusing on North America would enable the broadest disciplinary variety, while situating my fieldwork within countries that have high per capita ecological footprints and corresponding needs for socio-ecological change. It also precluded the need for a translator and limited my international travel, which was necessary within the financial and time constraints of the research. See 4.2.3 for details.

On my first day, it was 105°F (~40°C) outside; I had landed in the midst of a deadly heatwave, which led to a record-breaking drought and widespread crop failures. Before my journey ended, I was also caught in a complete shutdown of lower Manhattan caused by Hurricane Sandy, the largest Atlantic hurricane on record at the time, and then by the unseasonal snowfall that closely followed. In between times, I encountered a wild black bear in the woods of Shenandoah, witnessed volumes of street-side ‘garbage’ like nothing I had ever seen, surveyed many fine examples of sustainable ecological design and practice, and as a South Pacific Islander, longed to see the coast more than I had ever done before. While my interview experiences resulted in an enormous volume and quality of insight, which supported the idea that people and the natural environment pervasively impact one another on an intellectual level, these observations and experiences on the road demonstrated the same in more visceral ways.

Returning home, and after many months ‘lost down the rabbit-hole’ of analytical data-immersion, I emerged resolute that I had robust answers to my research question – answers that addressed how everyday ways of life (including people’s ideas, values, actions, interactions, etc.), generate and are generated by societal institutions (e.g. social, occupational, economic, political, educational), how the two combine to inform sustainability (and unsustainability) in Western cities, and critically, how they might be changed along a number of backcasted² pathways, to create a more desirable future. Along the way, I adopted and adapted the emerging theory of ‘ecological habitus’ as a comprehensive lens for conceptualising the diversity and dynamism of socio-ecological³ factors entailed, and applied the theory to analyse the interview data. As anyone who has engaged with Bourdieu’s sociological ‘habitus’ theory will understand, once I began to delve into ecological habitus, conceptualisations of this began to permeate my consciousness inescapably. The outcome of this was an ‘ecological habitus framework’ that I developed, which enabled me to conceptualise more clearly why some of humanity’s unsustainable socio-ecological practices and paradigms persist. It equally assured me that I was justified in my original optimism, for I found that there are many pragmatic starting points for creating change in Western cities towards an ecologically sustainable future – some of which are enacted or proposed already and many of which have latent, backcasted potentiality.

This thesis presents a discussion of these pragmatic starting points and how they might contribute to broader social change, prefaced with a thorough documentation of the theoretical and methodological bases of my research process. For me, each prospective starting point offers hope that we can create a desirable, sustainable future; and an agenda for achievable, intentional change in the present with which to begin. I see these as appreciated alternatives to perplexed hand-wringing.

2. Backcasting is a problem-solving forecasting methodology applied (especially in sustainable futures research) when future forecasts based on the status quo predict undesirable socio-ecological outcomes (Robinson, 2003; Robinson, 1988). Backcasting begins with visioning of preferable future scenarios, then works backwards to identify barriers to realizing these visions, strategic pathways for overcoming these barriers, and actions in the present that can begin a process of change (Dreborg, 1996).

3. I.e. relating to people’s relationship with natural environments.

In the rest of this chapter I situate my research, beginning with a review of relevant background literature surrounding sustainability and cities, which leads into a concise problem statement. The research aim and objectives are presented as a response to this. The general limitations of the research are then discussed, and the interdisciplinary features of the thesis are explained. Finally, an outline of the thesis structure is provided.

1.1 BACKGROUND

This section provides background information on global ecological sustainability and urbanisation, Western cities and their sustainability, and the reasons why cities are promising places for change to begin. The definitions of some key terms are also discussed. At the end, the link between global sustainability, cities, and everyday practice is questioned, informing the problem statement that defines my research.

1.1.1 Global sustainability

The scale of growth witnessed in the human economy during the past few hundred years has been phenomenal. The repercussion of this “four-hundred-year boom” has been the unprecedented exploitation of natural resources, resulting in modification to, and degradation of, every ecosystem worldwide, an Anthropocene reality that has been on our radar for decades (Randall, 1987, p.4). Humanity’s ecological footprint⁴ now exceeds the biosphere’s capacity for regeneration (Lei & Zhou, 2012; Wackernagel, et al., 2002), requiring an estimated 50% more resources and assimilative capacities than the earth can provide (Ewing, et al., 2010). Recent research has found that Western nations, in particular, while boasting socio-economic wellbeing, all consistently exceed biophysical planetary boundaries (e.g. through appropriation of net primary production, carbon and nutrient pollution, sum of ecological footprint, etc; O’Neill, et al., 2018). Without retraction, such footprints will ultimately jeopardise global ecological resilience, geopolitical security, and contemporary standards of living (Daly, 2005; Rees & Wackernagel, 1996). For example, an estimated one in six species worldwide are predicted⁵ to be at future risk of extinction due to human induced climate change, and this risk will increase and accelerate alongside global warming (Urban, 2015). Such impacts are symptomatic of wider environmental stress and have unbounded flow-on effects across ecosystems worldwide.

4. This concept transforms the ecological impacts of an entity into a spatial measure. E.g. the land area covered by a city might be so many km², but the ecosystem-equivalent land area required to meet the city’s resource provisioning and waste assimilation needs would occupy a far larger area, which is the city’s ‘ecological footprint’.

5. This estimate follows a ‘business-as-usual’ emissions trajectory (leading to a 4.3°C global temperature rise) based on Urban’s (2015) meta-analysis of 131 studies. Even a more optimistic scenario, where temperature rise is limited to 3°C would threaten an estimated 7.9% of species, or one in 13 (with 95% confidence).

The effects of such environmental disharmony upon human habitation are predicted to be similarly severe. For example, as climate change and sea level rise progress, the frequency of extreme weather events such as hurricanes and their effects (e.g. inundation of infrastructure and housing, due to storm surges) are also expected to increase (Grinsted, et al., 2013). With the majority of the world's cities situated along coastal margins, such threats are critical to the future security of global cities (Barber, 2013). Moreover, the scale of associated economic impacts has been evidenced in recent years. For example, Hurricane Katrina and Hurricane Sandy cost the United States an estimated \$108 US billion and \$71.4 billion respectively, while costing close to 2,000 people their lives (NOAA, 2014).

This legacy of exploitative economics and perpetual economic growth, seeded in the relatively 'empty world' of the 20th century, is unsustainable (and *un-economic*) in today's 'full-world', which is now home to billions more people (Costanza, 1992; Daly, 2005; Schumacher, 1973; UNEP, 2016). Consequently, transitioning from goals of perpetual quantitative economic growth in favour of qualitative global development within sustainable⁶ biophysical limits (so called 'strong-sustainability') is viewed as the fundamental challenge of the 21st century (Goodland & Daly, 1996; Raskin, et al., 2002; Rockstrom, et al., 2009; Senge, et al., 2008). This was foreseen decades ago by theories and scenario models in human biology (Ehrlich, 1968), systems science (Meadows, et al., 1972), and resource/ecological economics (Daly, 1990; Ehrlich, 1989; Randall, 1987; Schumacher, 1973); and is now increasingly evidenced in quantitative ways (Costanza, et al., 1997; Lei & Zhou, 2012; Wackernagel & Rees, 1998).

Sustainability is a longstanding (Brundtland, 1987) and ongoing aspiration of international policy. Most recently, for example, the Paris Agreement drew 191 global signatories as part of the United Nations Framework Convention on Climate Change, demonstrating a near universal recognition of the need for sustainability (UN, 2016a). Nevertheless, current levels of global resource use are unsustainable and continue to rise, with predictions that resource use will triple by 2050 (UNEP, 2016). Accordingly, creating more widespread change towards sustainable alternatives is becoming increasingly urgent.

Sustainability has historically been depicted as resting on three 'pillars' or 'domains' (ecological, economic, and social), with the recent addition of a fourth 'cultural'⁷ pillar. These portray the diversity of socio-ecological factors involved in sustainability (Mulligan, 2014). Most regulation and legislation follows this model (e.g. see UN, 2015a). More critical conceptualisations of sustainability nest all other factors within an overarching sphere of ecological sustainability (e.g.

6. 'Sustainable' biophysical limits describe reducing global exploitation of ecological sources and sinks to within limits that can be sustained perpetually (i.e. reducing humanity's net ecological footprint until it is equivalent to less than one planet Earth).

7. The cultural pillar was added to better represent the interests of people as agents of sustainability. It highlights the roles of "literacy, creativity, critical knowledge, sense of place, empathy", and other cultural capabilities in creating sustainability (Pascual, 2012, p.4).

Costanza, et al., 2013) to represent the fundamental necessity of the ecosphere to human economies, societies, and cultures. Some advocate for the dissolution of such categories altogether, towards more holistic integrations of ecologies, economies (market, informal, non-monetary, etc.), and societies (political, cultural, etc.) across spacio-temporal scales (Giddings, et al., 2002).

Following the Brundtland (1987) tradition, in this thesis ‘sustainability’ is used with a particular focus on managing human activity, in the broadest sense, to ensure that the fundamental ecosystems that support life on Earth (including natural capitals such as clean air and water, and fertile soil, and the ecosystem services⁸ that regulate and regenerate these capitals) are maintained or ideally *enhanced* long-term, with the intention that both current and future generations of people and other life forms can experience wellbeing and security of natural provisioning. These ecological dimensions of sustainability are fundamental to all other economic, social, and cultural successes (Costanza, et al., 2013).

1.1.2 Global urbanisation

Urban areas are of particular significance to sustainability as they entail the most dense human populations and intensified resource use. People flock to urban areas for economic, social, and political opportunities and improved quality of life, with rates of urbanisation ever increasing. Furthermore, urban areas generally contain wealthier populations (on average), and concentrations of industry and commerce. All of this makes them more resource-intensive than their less developed counterparts (McGranahan & Satterthwaite, 2003). Accordingly, as urbanisation progresses and intensifies, humanity’s ecological footprint also grows. Today the world is more urban than ever, with more than 54% of people estimated to be living in urban areas⁹ (UN, 2016b). The predictions are that this intensification will continue, with an urbanised global population of 60% expected by 2030 (UN, 2014).

8. Ecosystem services include climate, soil, nutrient, atmospheric, and hydrological cycling; biodiversity; supply of habitats, food, fibre and fuel; genetic, scientific and medical resources; and aesthetic, recreational, spiritual, and cultural value. Early estimates calculated these services to be worth USD \$33 trillion per year to the USA, around twice the nations GDP (Costanza, et al., 1997). This is expected to increase as ecosystems are degraded, threatened (e.g. by climate change), and lost.

9. What counts as an urban area is variable, with no internationally agreed definition (UNSD, 2017). The United Nations’ statistics quoted here amalgamate many countries’ figures, spanning ‘urban areas’ that contain anywhere from 200 residents to 10 million or more.

The UN define ‘urban areas’¹⁰ as built-up areas with relatively dense human populations (especially in the West) and relatively well established infrastructure, education and other measures of development (especially in developing nations) (UNSD, 2017). Within population statistics, urban areas are contrasted with rural areas and their agricultural workforces and economies (UNSD, 2017). Examples of rural and urban areas are shown in Figure 1.



Figure 1: Photographic montage showing spectrum of landscapes from rural/low density to urban/high density. Left to right: remote/wilderness; rural living; urban areas including low-density town/village; medium density suburbs; and high-density downtown (adapted from Mayer, 2015).

The UN’s broad definition means that urban areas can include villages, smaller towns, settlements of a few thousand people, sprawling suburbs, large cities (with populations >500,000), and even megacities of ten million people or more. Most governments worldwide consider a population threshold of between 1,000–5,000 inhabitants (on average) to constitute an urban area (McGranahan & Satterthwaite, 2003). I use ‘urban’, ‘urbanites’ and other corresponding terms in a more limited way, to describe the most urban end of the spectrum: the people, processes and, institutions etc., found within cities. What constitutes a city is another contentious idea, as discussed below.

10. I focus on the UN definition here, as this is the source of most population statistics in my thesis. Elsewhere in the literature, urban is used variously to describe population density, land use, or other factors. Most literature uses authors’ ‘own definition, or none’ (McIntyre et al., 2000, as cited in Andersson, 2006, p.1).

1.1.3 Ecological impact of Western cities

Western cities are the focus of this thesis. In Western nations, around 80% of the population is now concentrated into urban areas including cities (UN, 2014), and people in these cities are far more resource intensive than the global average. All Western cities combined contain less than 10% of the world's population, yet they account for an estimated 60% of humanity's total ecological footprint (Rees & Wackernagel, 1996), making their average¹¹ per capita ecological footprints the largest in the world (Ewing, et al., 2010).

Sprawling¹² cities generate even larger ecological footprints, due in part to their dependency on private automobiles for transportation (Weisz & Steinberger, 2010) and their corresponding expanses of infrastructure, land use change, and their greenhouse gas emission profiles. Many sprawling cities in the United States (e.g. Los Angeles) exemplify such resource intensive lifestyles. If similar lifestyles were adopted on a global scale, an estimated 4.5 Earth-equivalent planets would be needed to sustain humanity (Ewing, et al., 2010). This scale of resource consumption does not provide the strong sustainability¹³ necessary for a secure global future.

As a whole, the West is responsible for the majority of modern and historic resource consumption, greenhouse gas emissions, pollution, and waste; and is also more economically capable of making necessary changes. Moreover, the West is argued to be morally obliged to set standards and lead the way for developing nations as they establish their respective economic bases (McGranahan & Satterthwaite, 2003). What is more, the anthropogenic environmental impacts now facing humanity will plague the West as much as anywhere, as evidenced by the hurricanes noted above.

Fortunately, the conditions of growth that have expanded Western cities' ecological footprints also pave the way for innovation; creativity; technological, conceptual, and social development; and other self-salving solutions (Landry, 2000). Next, I define what a city is, before discussing some characteristics of Western cities that make them ideal starting points for fostering sustainability.

11. As an average, this does not represent the footprint of every Western household; even within Western cities, there is often great disparity (McGranahan & Satterthwaite, 2003).

12. Sprawl describes relatively low-density urban areas, often found around cities' peripheries (e.g. in Los Angeles, CA, and Auckland, NZ). Sprawl is characterised by siloed land-use zoning whereby residential areas, work places, shops, and civic amenities (e.g. schools) are separated and distanced from one another, and serviced by expansive parking and large-scale roading networks designed for private vehicle transport (and often inhibiting safe, easy, and enjoyable pedestrian access to amenities; Duany, et al., 2000).

13. 'Strong sustainability' specifically refers to the retention of in situ reservoirs of natural capital in volumes sufficient to enable perpetual self-regeneration, rather than viewing man-made capital (e.g. technology) as a substitute for natural capital.

1.1.4 Defining the city

The word ‘city’ has multitudinous definitions that cast cities as physical formations, historical artefacts, economic and political hubs, social networks, and cultural features. Cities are also a form of urban area, as noted above (Seto, et al., 2010). However, an effective definition should describe what all cities have in common and what sets them apart (Maunier, 1910). In the historic and recent past, cities were defined by their fortifications or presence of a cathedral. Later, measurements such as morphology, population size, or physical footprint were used (Maunier, 1910); while other definitions focused on functional factors, such as trade or demographics (e.g. birth rate). Still others are based on concentrations of specialist activities such as industry, trade, or technology (Maunier, 1910), or political administrative boundaries (Seto, et al., 2010).

Further definitions arise in accordance with different academic fields. Sociologists, for example, have defined cities by the anonymity provided by their large scale (Hubbard, 2017). Political economists often define cities by class divisions or their influence in globalised politics. Planners take more materialistic approaches, considering organisation, land use, and dimensions. Meanwhile, logistics and engineering focus on flows of materials, resources, communication, traffic etc., to describe what a city is (Hubbard, 2017).

City administrators also use varying definitions. For example, the United Nations (2016b) compiled population data on 1,692 cities (of 300,000 or more inhabitants), and found that 55% of them measure ‘city’ boundaries as an ‘urban agglomeration’ (i.e. the extent of the continuous built-up area). The ‘city proper’ definition was used by a further 35% of cities, delineating a city by its administrative boundaries, which are potentially more confined than the area of urban agglomeration. A final 10% defined themselves by total ‘metropolitan area’, which constitutes the most wide-ranging boundary, including a city’s total economic and social systems, interconnected through commerce and commuting (UN, 2016b).

None of these definitions apply universally to cities or provide a sufficient definition (Maunier, 2017 [1910]). Instead, more than a century ago, Maunier (2017 [1910]) argued that the best way to define a city is as:

A complex, geographically localised social establishment that includes numerous distinct social groups.

Maunier argued that it differentiates cities from more simple social establishments such as farms, hamlets, or villages, which form communities that function as a “single political and social organism[s]” (Maunier, 1910, p.542). It also distinguishes the localised (i.e. bounded) social geography of a city from “totemic [social] clans” such as companies and churches, which overflow from one place to another, linked by ideology rather than by spatial positioning

(Maunier, 1910, p.544). Moreover, contemporary scholars agree that the complexity of cities is what sets them apart. For example, Landry (2000, p.4) defines cities as “complex amalgam[s] of diverse people, interest groups, institutions, organisational forms, business sectors, social concerns, and cultural resources”.

I refer to Western cities with a combination of these definitions in mind, as complex, geographically localised and diverse social establishments situated within distinctly man-made environments. They include but are not limited to areas of dense population, a diversity of social, economic and cultural groups, and continuity of built structures (i.e. urbanised areas), hubs of economic/commercial/industrial activity, and areas of distinct municipal governance. This includes suburbs - where these are part of the city as it defines itself. Population is no longer seen as the key metric of cities, but to clarify for the reader, the cities exemplified in this thesis generally exceed populations of 100,000 people.

1.1.5 Agglomeration value of cities

As noted above, cities are global hotspots of human population and resource consumption. To their credit, however, they are also hotspots of economic value creation and socio-political and creative innovation. Globally, cities generate more than 80% of global gross domestic product, making them the most economically productive places on earth (UNDP, 2016). This is due to population density and economies of scale. Historically, economies of scale made cities appealing, enabling the development of sanitation, education, health and safety, technological innovation, civic employment, and other key infrastructures (Seto, et al., 2010). In the West, these benefits are largely taken for granted, but the benefits of agglomeration persist.

Concentrating people in space (i.e. agglomeration) also provides more dense social and material networks, enabling “cost savings due to proximity” and engendering creativity (Khanna & Khanna, 2015, p.95). One contributing factor is the localised densities of similar agents, which enables specialisation; Silicon Valley is an obvious example. Proximity of complementary agents can also mean less transportation and energy costs in the delivery of products and services, along with the mixing of people and ideas (Seto, et al., 2010). Thus, interactions and exchanges can become easier and cheaper (Khanna & Khanna, 2015). Finally, concentrations of population combined with increasing globalisation means that cities can be interlinked, while also extremely culturally and otherwise diverse (Landry, 2000). This interconnection and concentration of different agents can promote ‘generativity’ - the enhanced capacity of agents to connect with others through “healthy chaos and experimentation” to generate “unanticipated outcomes and change” (Khanna & Khanna, 2015, p.41). Such connections can also facilitate inter-cultural-literacy and understanding, and engender innovation and insight (Landry, 2000).

Therefore the larger, more complex, and more globalised a city becomes, the more capable it may be of developing innovative and effective solutions to the environmental and other problems of a place's urbanisation (Landry, 2000). For example, the compact city forms enabled by dense populations can reduce encroachment on green-field land (wilderness or agricultural) as well as making public transport more economic to run and practical to use, with potential reductions in transport emissions. Concentrations of occupational, recreational, and domestic spaces within cities can also make cycling and pedestrian activity a more practical and interesting means of transport. Cities' wealth can also enable employment of smart technologies that automate efficient resource use, while improving quality of life (Khanna & Khanna, 2015). For example, real time data monitoring of public transport ridership can be used to coordinate effective and timely connections for commuters.

1.1.6 Cities as day-to-day socio-ecological interfaces

Significantly, the biophysical environments of today's cities have historically been, and continue to be, shaped by the values of societies who live within them. In turn, as the most common backdrop to people's everyday lives, Western cities shape the lifestyles of individuals within them and contribute to their experiences and expectations of the environment (Harvey, 2003; Lake, 2010). In a material sense, what a modern city is or should be (e.g. how it should look and function) is envisioned and negotiated by planners, architects, engineers, designers, property developers, etc., and then imprinted as material reality (Bridge & Watson, 2011). It is furthermore represented imaginatively in books, art, film, and other media; and ideologically in authority-generated promotions, policies, and regulations that can further influence people's conscious and unconscious "desires and imaginaries" (Bridge & Watson, 2011, p.7). Of particular concern in my research is the way that cities shape socio-ecological interactions.

Compared to the familiar environments of previous (e.g. pre-industrial) generations, access to 'nearby-nature'¹⁴ has significantly diminished for many city dwellers, alongside the opportunity for first-hand interactions with ecologies of integrity¹⁵ such as natural waterways, biodiverse forests, or native birds (Kellert & Wilson, 1993; Louv, 2011; Orr, 2004; Pyle, 1978; Pyle, 2003; Suzuki, 2007 [1997]). There is increasing concern about this divorce of city dwellers from the

14. 'Nearby-nature' (from psychology) describes nature that is easily accessible from home, play, or work places (Kaplan, 1984).

15. While urban ecosystems can be diverse and provide many services to people such as shade, recreation, beauty, nutrient cycling, and biodiversity (e.g. large old parks; Andersson, 2006), these differ in character from the natural systems that they replace. Human preference mostly dictates what species occur (often privileging ornamentals, exotics, and domesticated species) and limits natural processes (e.g. predation, competition, seed dispersal, patch dynamics, senescence, and decomposition; Alberti, 2005; Andersson, 2006). Urban ecosystems are also characterised by small, patchy, disjointed habitats (e.g. individual yards or parks), proliferation of opportunistic or invasive edge-species; a hotter climate; and modified hydrology (e.g. drained, polluted, or culverted waterways; and eutrophication of fresh water and marine environments; Grimm, et al., 2008). Because they are often continually maintained in a 'steady state' (e.g. grass lawns) urban areas are also resource (and labour) intensive (Andersson, 2006).

more natural ecological systems upon which humanity ultimately relies; a separation that manifests physically, mentally, emotionally, spiritually, spatially, and temporally.

With increasing global urbanisation, this ‘extinction of experience’ (Pyle, 1978) is diminishing people’s intimate connection, understanding, empathy and affection for the natural world (Pyle, 1993). Consequently, restoring the connections between people and nature¹⁶ to facilitate mutual regeneration and flourishing is a focus of much environmental literature (Barnhill, 1999; Botkin, 2000; Lake, 2010; Pyle, 2003; Smith, 2001; Suzuki, 2007 [1997]) and informs discussions of sustainability in cities (Beatley, 2011; Brantz & Dümpelmann, 2011; Hopkins, 2008; Kenworthy, 2006; Leman-Stefanovic, 2012; Register, 2002). Significantly, as I argue here, as most Western people’s everyday environment, cities have the potential to become an interface of socio-ecological reconciliation and communion (Rees, 1997; Rees & Wackernagel, 1996) and have unique potentialities as agents of change.

1.1.7 Cities as units of change towards sustainability

Politically, cities have the potential to lead broader-scale, societal change. Localised city authorities play the major role in planning, regulating, guiding, and managing cities and their sustainability and are often responsible for implementing larger-scale sustainability guidelines (McGranahan & Satterthwaite, 2003). For example, city-based regulations such as design performance standards and energy efficiency measures can be used to implement national level climate legislation (McGranahan & Satterthwaite, 2003) or contribute to international projects such as the United Nations Sustainable Development Goals (UN, 2015b). In practice, such local level management can have significant benefits, for example, in New York City, where buildings account for more than 80% of the city’s carbon emissions (Barber, 2013).

Even in the absence of cohesive or effectual national policies on sustainability, cities are proving to be agents of sustainable change. For example, despite the United States opposing global conventions on climate change at a federal level, many local authorities (e.g. California) have already committed to acting on this cause (McGranahan & Satterthwaite, 2003). City authorities, often led by mayors, are banding together in collaborative efforts, united by shared challenges such as transport, energy, and sea level rise, and buoyed by evolving online networking capacities (Barber, 2013). The C40 Climate Leadership Group is an example that unites 91 cities, accounting for a quarter of global GDP (CCLG, 2017). Speaking at a C40 conference in 2012, New York City Mayor Michael Bloomberg proclaimed, “Nations talk, but too often drag their heels—cities act” (Loeser & La Vorgna, 2018, para. 15). Within networks

16. ‘Nature’ is used here primarily to describe ecosystems, their components (both biological, e.g. plants, animals, bacteria; and physical, e.g. mountains, rivers), and their emergent properties (e.g. climate and nutrient cycling). ‘Pristine’ ecosystems (if any remain) are purely natural by my definition and contrast with ‘synthetic’ or ‘man-made’ systems and their components, forming a spectrum of ‘naturalness’ (e.g. humans and selectively bred animals are synthetic to degrees, but are also more ‘natural’ on the spectrum than synthetic chemicals or plastics, for example).

like C40, cities can “learn from one another and work together in creating, evaluating, and replicating new financing structures for improved mass transit, alternative power generation, and other ‘green’ projects” (M. Bloomberg quoted in Loeser & La Vorgna, 2018, p.6). Bike share programs are an example of how cities have shared and adopted sustainable initiatives without larger-scale legislation in place. Beginning decades ago (e.g. in Portland), bike share programs are now found in many cities including New York and Washington, DC (Barber, 2013) and even in smaller cities across the world, such as Christchurch, NZ (CCC, 2018).

Another capacity of city-authorities as agents of change is that they are the closest unit of government to ordinary people, enabling them to work closely with communities on the ground in ways that nations/states often cannot (McGranahan & Satterthwaite, 2003). For example, through pilot programs, voluntary or regulated best practice measures, and informal resident-based policies (Barber, 2013). City dwellers and communities use and “remake the city everyday” and partnering with them can provide local government with valuable insights into the way that cities might be developed and managed to habitually support their interests (Jacob, 2015, p.xi) which includes maintaining quality of life over space and time (i.e. through sustainability) (Khanna & Khanna, 2015).

1.1.8 Sustainable cities: definition, examples, and competitive advantage

Providing quality of life to city dwellers is a key responsibility of city authorities, and sustainability is now widely recognised as fundamental to achieving this. However, what constitutes a sustainable city is another contested idea, with different definitions and visions of an ideal sustainable city arising from the many disciplines working in the field (Bridge & Watson, 2011; Guy & Marvin, 1999; Williams, 2010). Yet as Williams (2010) asserts, the principles underpinning sustainability (efficient and tempered use of resources and intergenerational equity) offer a sufficient ‘anchor’ for the concept, beyond which a plurality of approaches are necessary and should be encouraged. While others call for a ‘unified theory of sustainable cities’ (e.g. Ratcliffe, et al., 2006), describing features that are commonly seen to constitute a sustainable city will suffice here. Significantly, the goal of sustainable cities is not to be autonomously self-sufficient within city bounds, but to contribute to sustainability across a broad-scale (e.g. city, regional, national, and global) (McGranahan & Satterthwaite, 2003) and to enable city inhabitants to enact sustainable dispositions with relative ease.

Table 1 below summarises some of the factors that constitute a ‘sustainable city’. Many older Western cities (e.g. London and New York) organically evolved¹⁷ with sustainability-compatible

17. I.e. through incremental growth that adapted to city dwellers’ lived requirements, rather than being master-planned (Alexander, 1965).

features (e.g. density and tube/subway networks) as integral parts of their organisation and infrastructure, before the rise of private automobiles (or the concept of ‘sustainability’). In contrast, modern ‘synthetic’ cities, or parts of cities, that have been designed from scratch (Alexander, 1965) are often less inherently sustainable. Sprawling cities are an obvious example of this (Duany, et al., 2000); however, even sprawling cities are now innovatively retrofitting sustainability features (Dunham-Jones & Williamson, 2011).

Table 1: Examples of what makes a sustainable city. This list is compiled from a wide variety of sources, but key scholars are noted with each factor for reference purposes.

- Compact (human-scale), mixed-use urban form, led by planning, design, and management of socio-economic growth to reduce encroachment of urbanisation into the wider landscape and improve quality of life (Duany, et al., 2000; Jacobs, 1961; Seto, et al., 2010).
- Pedestrian, cycling and public/mass transport infrastructure is prioritised above roading/parking for cars to reduce greenhouse gas emissions and improve quality of life (Kenworthy, 2006).
- Ecosystems and natural features (including native species, natural hydrology, and productive food systems) permeate the city and are protected and restored to enhance localised ecosystem services and provisioning (e.g. climate change resilience, genetic biodiversity, recreation, education) (Beatley, 2011; Leman-Stefanovic, 2012).
- The public realm is improved to strengthen civic engagement, social interaction and connection, trade, equity, and practical sustainability initiatives (Kenworthy, 2006; Landry, 2000).
- Renewable and closed-loop resource systems are applied to manage water, energy, and waste, reducing resource consumption and pollution (Register, 2002).
- The city’s economic productivity is stimulated by innovation, cultural and other diversity, creativity, and the particular environments, history, and culture of the area (Kenworthy, 2006; Landry, 2000), and localisation is encouraged (Hopkins, 2008).
- Decision-making aims to be visionary and holistically sustainable (integrating the four pillars of sustainability), as well as democratic, inclusive, and empowering (Hester, 2006; Register, 2002), and cities share best practice and learn from one another (Ratcliffe, et al., 2006).

Cities in general are increasingly focusing on such sustainability metrics as core principles for their development. A leading example is the ecological enrichment of ‘biophilic’ Singapore, which began in the 1960s (Beatley, 2018). Its location on a peninsular gives Singapore a naturally compact, dense form, and it is permeated by networks of uninterrupted green space, which encourages foot traffic and cycling. Green rooves and hanging gardens are also common

features, contributing to the estimated 47% of the city's land surface that has vegetative cover (Beatley, 2018). Sustainability is supported by the Government's 'Sustainable Singapore Blueprint 2015' plan, which, for example, aims to ensure that 90% of households are within a ten-minute walk of a park, and 80% are within a ten-minute walk of a train station (Sustainable Singapore, 2018). Other examples of progressive sustainable cities include Amsterdam, Stockholm, Copenhagen, and many other European cities, which demonstrate how first-class economies and living standards can be achieved alongside advanced sustainability initiatives (Floater, et al., 2013; McGranahan & Satterthwaite, 2003).

Indeed, sustainable innovation in cities is now recognised as a competitive advantage, and the diversity of sustainability challenges we face offers potential for every city to become a front-runner in one or more facets of the sustainability revolution (Lombardo, 2017). However, as cities increase in size and cope with the challenges of ongoing growth and development, the pace at which innovation must occur also increases (Bettencourt, et al., 2007); cities must "reinvent or die" (Ratcliffe, et al., 2006, p.652). Increasingly, being 'clean, green, and safe' will be fundamental features that attract people to particular cities (Ratcliffe, et al., 2006), including the mobile, talented modern workforce that is required to keep pace with cities' needs for creative innovation (Khanna & Khanna, 2015).

1.1.9 Challenges, aspirations, and everyday practice in 21st century cities

As the above discussion has outlined, cities are fundamental units of contemporary innovative and sustainable change, and sites where the unprecedented challenges of the 21st century, such as climate change, will be won or lost. As cities grow, develop, and are constructed and reconstructed as hubs of political, economic, cultural, and environmental action, the opportunity exists to make these places of both ecological sustainability and human wellbeing (Seto, et al., 2010). The knowledge and technologies required to respond to these momentous challenges already exist (Botkin, 2000) and are exemplified to degrees in existing sustainable city initiatives. However, such cities are still far from the norm, and looming global ecological crises remain.

Thus, further reimagining of socio-ecological interactions remains necessary and this will require critical reflection upon, and radical change within presiding social, cultural, economic, and political paradigms (Ratcliffe, et al., 2006). In particular, positive and engaging future visions are sorely needed as an antidote to the many sacrifice-based narratives of future sustainability (Ilstedt & Wang, 2014; Lappe, 2011), an ethos that informed my own hand-wringing at the outset of this research. Constructing and realising such alternative visions is a complex task and will require the input and the unprecedented integration of diverse disciplines

(Beddoe, et al., 2009; Ratcliffe, et al., 2006). However, the way such dramatic change could play out in practice remains to be seen, and is one of the fundamental challenges of our time (Suzuki & Dressel, 2009).

It is widely acknowledged that sustainability requires ‘thinking globally’, but equally obliges action at smaller, local, regional, and national scales (Ratcliffe, et al., 2006; Werlen, 2015). Furthermore, paradigmatic societal shifts are recognised as intractable challenges, while paradigm shifts at the level of individuals can be achieved through intentional everyday changes (Meadows, 1999). As home to most people, cities are now the everyday nexus where these global/local, societal/individual negotiations take place. Cities, as our habitats, inform how we see (and *be*) in the world, and in return, the way people act and interact within cities is increasingly determining what our world will become (Lake, 2010).

However, the role that socialised everyday practice within cities can play in creating change towards wider ecological sustainability has been relatively overlooked in sustainability research, in favour of technical and macro-scale agendas. It is “a pragmatic and highly unspecialised realm of human existence that is routinely excluded from analytical registers – the spaces, places and moments that are literally left over after technical measures... have been exhausted” (Whitehead, 2009, p.666). Yet drawing global socio-ecological issues into the tangible level of the everyday is a promising means by which to bridge disciplinary specifics and generate common understandings (Werlen, 2015), although this is another relatively unexplored area of research. Not only do our visions for the future inform our practices, but our practices – from the everyday to the episodic – inform our perceptions of what is possible for our futures (Ilstedt & Wangel, 2014). However, it is people’s daily practices that have cumulatively propagated today’s socio-ecological crises, and it is practice that perpetuates these (Brand & Wissen, 2012; Gäbler, 2015). Everyday practice, therefore, is a significant spacio-temporal location for making change to our future prospects (Ilstedt & Wangel, 2014). In this thesis, I explore how everyday practice within cities (the everyday environment of many Westerners) could be a fertile place for sustainable change to begin.

1.2 PROBLEM STATEMENT

The individual and societal pursuit of ecological sustainability is critical to achieving collective economic, social, cultural, and global wellbeing. Despite decades of sustainability research and agendas, and increasing acceptance and enactment of these worldwide, the challenge of creating widespread sustainability remains and is becoming increasingly urgent. With their ecological footprints, creating sustainability in Western cities is clearly a pivotal factor in responding to this challenge. While some cities are already evidencing leadership in the sustainability transition, strategic ways to accelerate and expand this towards full-spectrum normalisation of sustainability are required. The socio-ecological nexus of people's everyday lives is a relatively underexplored factor in the reproduction of unsustainability, but is also a promising site for pragmatic change to begin. Correspondingly, a research challenge for environmental management focused on sustainability is to identify pragmatic day-to-day changes in the ways that people live in Western cities, which could contribute strategically to society-wide sustainability. Thus, the question is, how might people in Western cities begin to create sustainability through everyday change? How then *could* we live, to generate a better world?

1.3 AIM

The aim of this research is to identify pragmatic pathways towards ecological sustainability, through strategic change in people's everyday lives within Western cities.

1.4 OBJECTIVES

The research objectives are to:

1. Review literature from across disciplines related to socio-ecological problems and solutions in contemporary Western cities, in order to identify leading experts to be interviewed;
2. Design a qualitative expert interview instrument and execute this to generate interdisciplinary expert insight and foresight that responds to the research aim;
3. Develop a methodological and theoretical framework for analysing the interdisciplinary interview data, and framing pragmatic pathways towards future sustainability; and
4. Pinpoint practical everyday changes that individuals within Western cities might undertake to contribute strategically to an ecologically sustainable future, with reference to the framework from Objective 3.

1.5 LIMITATIONS OF RESEARCH APPROACH

A few key limitations are outlined here to demonstrate the focus and bounds of this research, while more explanation is given and specific limitations discussed in the method and methodology chapters.

Epistemology and methodology

Primarily this research is limited by its focus on how sustainability in the future could be created by everyday change in Western cities of the present, and by the exploratory, generative, and inductive research approach that I have chosen to take (which was underpinned by the distilled insight and experience of established experts in the field). This is a patently normative¹⁸ and constructive approach in that it focuses on ways to create a *desirable* future, rather than predicting a *probable* future based on observable existing norms. Such constructive future-forecasting is an established approach in environmental management (Barrow, 2006), futures research (Bell, 2004), and sustainability backcasting (Dreborg, 1996; Quist, 2007). Thus, this research does not assume objectivity, describe or analyse a particular case study (e.g. Singapore as a biophilic city), attempt to test a specific hypothesis, or measure or test results quantitatively in regard to expert narratives or existing ecological research. Additionally, actioning change along the pragmatic pathways towards sustainability that I present here, and applying the ecological habitus framework that I propose (e.g. through participatory, action-based, or case study research) was not the focus of this research.

Pragmatism

This research focuses on envisioning alternative futures and identifying pragmatic ways to begin socio-ecological change. Therefore, unintentional, uncontrollable, unworkable, or perceivably unrealistic practices and futures are not pursued. Furthermore, potential macro-scale changes are not the main focus of this thesis (e.g. economic, political, or educational reforms or radical revolutions); although everyday changes outlined herein may collectively contribute to these.

Theory

Stemming from the field of environmental management, this research engages ecological habitus as a heuristic, change-orientated conceptual research tool as part of a constructive (yet normatively situated) and future-orientated/backcasting approach, in line with my research aim. It does not seek to employ wholesale Bourdieuan analysis of the interview material, experts' backgrounds, or my own background. Nor does it seek to analyse or critique Bourdieu's theories to any extent beyond the requirements of the research objectives. Habitus and other Bourdieuan notions are

18. I use 'normative' throughout this thesis in the sense of normative-theory to mean 'subjective' or value-orientated. This is in contrast to the relative 'objectivity' of positivistic theory, and is also distinct from 'normal' (i.e. what is perceived to be usual).

described and engaged to inform comprehension of ‘ecological habitus’ in extant literature, and with reference to my development and deployment of ecological habitus herein.

Experts

Finally, the research focuses on the insights of a select sample of experts from the United States of America and Canada regarding socio-ecological issues in and of cities. While this may offer value particularly (but not exclusively) to cities in other automobile-orientated Western countries (e.g. New Zealand and Australia), experts from these countries along with experts from more sustainable Western nations (e.g. Scandinavian) could not be interviewed within the scope of this research.

1.6 CONTENT AND STRUCTURAL FEATURES OF THE THESIS

This short section outlines the interdisciplinary content and language of the thesis, and explains how some chapters are structured as manuscripts. Finally, a statement of authorship is made.

1.6.1 Interdisciplinary content and language of the thesis

This thesis is interdisciplinary¹⁹ and includes features from both sciences and social sciences. For example, Chapters 3-5 include both methods (description of the research procedures) and methodology (theory of methods). In-depth methodological discussions such as mine are relatively uncommon within natural science PhD theses, while social scientists may see these as commonplace (and therefore potentially taken for granted). Consequently, my annotated interview methodology highlights ideas that were new to me as an ecology graduate in the natural sciences, for example the role of transcription as a form of analysis. Personal pronouns are also included within most chapters, which is less common in natural sciences.

This thesis contains an interdisciplinary assemblage of core terminologies and concepts. For example, ‘natural capital’ from ecological economics, ‘reflexivity’ from anthropology and social science, ‘ecology’ from natural sciences, and ‘cities’ from an assemblage of disciplines. Many of these terms have specific, nuanced meanings within different fields that may be taken for granted by some readers, while being unfamiliar to others. These terms and concepts are consequently defined as I proceed to clarify my own position and acknowledge potential readership diversity.

19. Interdisciplinarity is a synthesis of multiple disciplines, and refers here especially to social and ecological syntheses (see 8.4.2, p.187).

1.6.2 Manuscripts within the thesis

Four chapters of this thesis (Chapter 7-10) are structured as manuscripts. These are presented here as part of the assessed, written components of my PhD research. These may later be revised and prepared for peer-reviewed publication, but publishing and achieving final publication standards are beyond the scope of this monograph thesis. These manuscripts include their own topical backgrounds and highlight particular points of relevant theory. The relative independency of these chapters inevitably results in some repetition (e.g. acronyms are re-explained anew). However, repetition is avoided where possible, and cross-referencing is employed to this end.

The manuscripts are firmly embedded within the thesis structure as a whole. Primarily, this introduction provides an overview of their place within the thesis, and they are framed theoretically in Chapter 2, methodologically in Chapters 3-5, and with reference to my theoretical developments in Chapter 6. Finally, the conclusion brings together and highlights insights from across the thesis. The manuscripts diverge from a conventional scientific thesis structure, as is common in contemporary environmental management PhD theses, and many other fields, but have been formatted herein to maintain consistency of fonts etc., and create cohesiveness across the thesis as a whole.

1.7 STATEMENT OF AUTHORSHIP

I, Alice Taylor, undertook all of the research described within this thesis. I am also author of all content except where quotes are attributed to others. People who advised me are acknowledged above.

1.8 OUTLINE OF THESIS STRUCTURE

This thesis is organised according to the following structure.

Chapter 1: Introduction

This chapter situates the research, offering a background on sustainability and cities and presenting the problem statement, research aim, objectives, and general limitations. Content and structural features of the thesis are noted and the overall thesis structure is outlined.

PART I: RESEARCH APPROACH

Chapters in Part I of the thesis discuss the research approach including the theory, methodology, and methods.

Chapter 2: Theory review

This chapter reviews relevant literature on Bourdieu's sociological 'habitus', and relevant recent developments on this; and traces the emergence of 'ecological habitus' within socio-ecological literatures.

Chapter 3: Methodology

This chapter describes the methodology of the research approach overall, including the place of change-orientated futures research and backcasting within environmental management. It also discusses the methodology, pros, and cons of qualitative expert interviews in the context of this research.

Chapter 4: Interview method

This chapter presents a step-by-step description of my expert interview design and deployment with accordant methodological notes. Combined with Chapter 3, this responds to Objectives 1 & 2 (review the literature to select experts, and design and deploy an interview instrument, respectively).

Chapter 5: Analysis method

This chapter presents a step-by-step description of the data analysis alongside relevant methodological justification. Final data analysis was undertaken in parallel to the development of my conceptual ecological habitus framework, therefore the final sections of Chapter 5 should be considered in parallel with the content of Chapter 6. This responds in part to Objective 3 (develop a data analysis framework).

PART II: RESEARCH OUTCOMES

Part II of the thesis is prefaced with a short introduction and contains the research outcomes. Within Part II, Chapters 7-10 are structured as manuscripts, with a note between each to reaffirm the relationship between them. These can be read with relative independence as the reader's interest dictates.

Chapter 6: Ecological habitus as an aspiration, descriptor, and framework

This chapter describes how I apply ecological habitus in this thesis, including the step-by-step development of my ecological habitus framework for change. This responds to Objective 3 (develop a framework for analysis and theoretical framing of results). Chapter 6 should be considered in parallel with the later parts of Chapter 5.

Chapter 7: Ecological reflexivity as a socio-ecological research tool

This manuscript defines ecological reflexivity, including its 'critical' variant (critER), which was a key component of my theory and methodology, and is a valuable potential tool for future research. This draws on results from the interviews, and feeds into Objectives 3 & 4 (contributing to the framework and providing a pragmatic starting point for creating a sustainable future).

Chapter 8: Sustainable city leadership amidst disciplinary silos

This manuscript discusses the need for proactive, innovative, and values based city authorities capable of leading sustainable city transitions. Disciplinary silos are a key barrier to this, but collaboration that builds critical ecological reflexivity and interdisciplinarity offers a potential, pragmatic way to strategically overcome these silos. This contributes to Objective 4.

Chapter 9: Growing sustainable ecological habitus with nature in the city

This manuscript emphasises the role of cities as human environments, and the potential site of human-nature reconnection. Potential ways of fostering this reconnection through nature enrichment are suggested. This contributes to Objective 4.

Chapter 10: Small ecological actions towards mainstream sustainability in cities

This manuscript presents small ecological actions (SEAs) as a means of engaging the mainstream of city people in sustainable ecological practice. This contributes to Objective 4.

Chapter 11: Conclusions and recommendations

This chapter provides a succinct description of how this thesis fulfils the objectives of the research and responds to the research aim. It also outlines how the research contributes to knowledge. Finally, promising directions for future research are recommended.

PART I: RESEARCH APPROACH

Chapter 2

THEORY REVIEW

2.1 INTRODUCTION

This chapter reviews the evolution of ‘ecological habitus’ within the literature. Ecological habitus was coined around 17 years ago by Mick Smith (2001), and has since been applied and developed within socio-ecological and other related fields, primarily with reference to Pierre Bourdieu’s well established sociological notion of ‘habitus’ (Bourdieu, 1972). Habitus is a ‘theory of practice’ that describes how socially situated and individually embodied paradigms and corresponding practices (e.g. unsustainable human-ecological relations) endure and are recursively reproduced or (crucial to my argument) changed, within societies, through time.

In the first part of this chapter, I review Bourdieu’s habitus. This includes definitions of habitus and related concepts and description of Bourdieu’s application of these within his research. Following this is a short section outlining contemporary critiques of Bourdieu’s habitus-related concept of ‘reflexivity’, and consequent developments upon this. I also explain how I apply reflexivity within this thesis. The purpose of reviewing Bourdieu’s theory here is to background my later review of *ecological* habitus theory. Therefore, this chapter does not review the general habitus of city people, as this is beyond the scope of this thesis. A general background of city life is given in Chapter 1.

‘Ecological habitus’ is the primary theoretical lens applied within this thesis. It describes the more ecologically salient dimensions of total habitus including the paradigms and practices of individuals that have relative significance for ecological systems, and how these are socially situated (e.g. within cultural norms), enacted (e.g. via consumption choices), reproduced, or changed. Later in this chapter, I review ecological habitus, with particular reference to four works that have most strongly contributed to my application of the concept within my research. There is little existing discussion around ecological habitus and city people. The second half of my thesis therefore bolsters these discussions.

2.2 REVIEW OF BOURDIEU'S 'HABITUS'

This section reviews Bourdieu's somewhat convoluted definitions and applications of '**habitus**' and related concepts. Habitus is a complex concept, examined extensively in contemporary sociological literature and applied across many other disciplines especially anthropology and education. The Latin root of the term means to "have" or to "be", eventually coming to mean "how one is" (Ayto, 2001, p.270). Originating from the word 'habit' - "a settled or regular tendency or practice" - lay definitions of habitus include it as a descriptor of physical constitution (Stevenson & Waite, 2011, p.639), describing 'tendency' or 'inclination'.

I equate habitus to a 'human operating system', comprising the software that works alongside a person's biological/physical 'hardware'. The hardware and the software offer one another benefits and limitations (e.g. what you physically or mentally 'can' or 'cannot' do), direct each other to degrees (e.g. what you do consciously versus how you respond instinctively), and change responsively to one another (for example when adapting to an injury or ageing), and to the outside world.

In sociology, habitus is used specifically to describe what people do: an individual's learned, embodied, and enacted set of preferences and dispositions (e.g. ways of thinking, speaking and acting). It simultaneously describes how these are conditioned within social groups or social fields, for example within ethnic groups or social classes (Giddens & Sutton, 2013; Ritzer, 2013). These social fields influence each individual's habitus, which collectively influence the field in return, in a recursive and discursive fashion (more on this in 2.2.2). Thus, habitus describes both social structures and individual understandings and actions, illuminating the mutually co-constructive dynamic between the two, and revealing how they are generated, enacted, reproduced, and changed through time.

Importantly, habitus, a 'feel for the game', is different from 'habit', the mechanical stimulus-response reflex (Crossley, 2013). While the flexible dispositions of a person's habitus and the enactment of these can occur pre-reflectively (i.e. subconscious), they are "commensurate with purposive action and in no way preclude[s] intelligence, understanding, strategy or knowledge on the part of the actor" (Crossley, 2013, p.139). People continuously do things without ongoing conscious consideration, once those practices are embodied (e.g. their gait). This does not make them 'unthinking actors' or preclude their conscious consideration or indeed their capacity for wilful change.

2.2.1 Background on Bourdieu's research approach

Habitus, as a contemporary sociological concept, was most notably developed by French sociologist, anthropologist, and philosopher Pierre Bourdieu (1930-2002) in the latter part of the 20th century (see, for example, Bourdieu, 1972; Bourdieu, 1990b, 1998). His research and application of habitus began with ethnographic studies of the Kabyle people in Algeria during the 1950s, followed by extensive publication across a diversity of topics including reflections on French lifestyle (Bourdieu & Passeron, 1979), education (Bourdieu & Passeron, 1977), academic values (Wacquant, 1989), politics (Bourdieu, 1999), and societal hierarchies of power (Bourdieu, 1979).

Bourdieu challenged sociological thought at the time, questioning the merit of overarching grand theory for theory's sake, and instead creating his own 'theory of practice' favouring a connection between empirical research (based firmly in practice) and the development of theory (Bourdieu, 1972). This more inductive approach to research corresponds with the likes of 'grounded theory' (Glaser & Strauss, 1967), which I also draw on in this thesis (see Chapter 3).

Bourdieu further emphasised the importance of researcher '**reflexivity**' in academic pursuits (Bourdieu, 1990a). Bourdieu's 'reflexive methodology' entails the idea of researchers bringing critical awareness to the various forces that influence their research, theory, analysis etc.; to the dynamics between habitus and its social context; and to the evolving structures of the intellectual field within which researchers' habitus operates. Bourdieu and other scholars' concepts of reflexivity and my own application are discussed later in this chapter.

Bourdieu saw reflexivity as a critical part of his research methodology and this reciprocally informed his sociological theory. Indeed, much of his research stemmed from such methodological-theoretical syntheses. For example, Bourdieu rejected comparisons of habitus to existing structurally-predictive or deterministic sociological theories, instead considering habitus a conceptual framework and methodology for investigating and understanding the complex, contradictory, and evolving nature of human sociology *in practice*. His provocative ambition was to transcend the sociological dichotomies of the era (e.g. between objective and subjective, structure and agency, individual and society, replication versus innovation) and this necessitated a more relational, dialectical theory (and philosophy). Spanning dichotomous reflexivity, and a focus on the individual and social mechanisms that generate stasis and change, are what characterise Bourdieu's research approach and are the foundation upon which he developed the concept of habitus (Bourdieu, 1998; Jenkins, 2002; Swartz, 1997).

There is a vast quantity of Bourdieuan literature, but it is not my ambition to review the scope of this here, or to analyse it in detail, as this has been done thoroughly and often elsewhere (e.g. Grenfell, 2004; Harker, et al., 1990; Jenkins, 2002; Reed-Danahay, 2005; Swartz, 1997). Rather, I

offer the following overview of Bourdieu's habitus and related key concepts to frame the origins and reveal the workings of ecological habitus, which is my focus.

2.2.2 Habitus, field, capitals, and practice

Another of Bourdieu's (more concise) definitions of habitus is as "the internalization of externality and the externalization of internality" (Bourdieu & Passeron, 1977, p.205). Unpacking this idea, it is a generative process that entails the influences of various social fields (externalities) such as home, school, or work (discussed further below) being embodied or internalised into individual people. Simultaneously the dispositions (internalities) that individuals hold are externalised through their routine (or sometimes innovative) practices that take place within their social fields, thereby contributing to the character of the fields that they occupy. I conceptualise this process as a cycle as depicted in Figure 2.

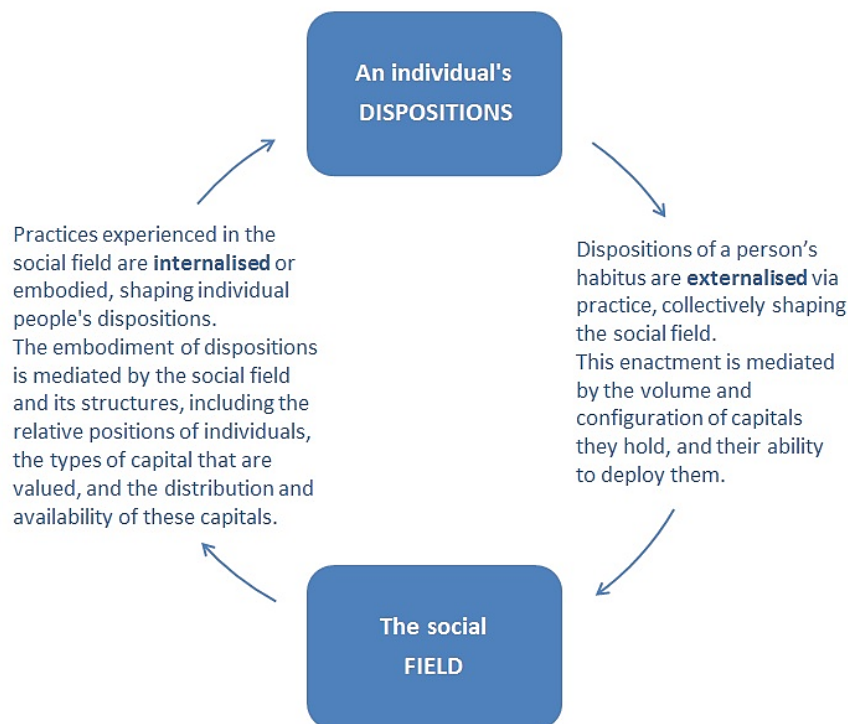


Figure 2: Cyclic diagram showing the individual dispositions and social fields that co-construct one another and constitute habitus.

Combined, these factors provide a person with a 'logic of practice', a sense of how to be (e.g. how to move, behave, communicate, etc.) in the world (Bourdieu, 1990b). Bourdieu was notorious for providing many different and convoluted definitions of habitus, looking at it from different perspectives to provide a 'sense' of what it entails, while ensuring its 'slipperiness' so that comfortable and limiting definitions of it could not easily be settled upon (Jenkins, 2002; Swartz, 1997). The translations of his early works from French have compounded this multiplicity. For

example, the phrase and title of his book ‘The Logic of Practice’ (Bourdieu, 1990b) is a translation of his original book ‘Le sens pratique’ (Bourdieu, 1980) and *sens pratique* (i.e. ‘practical sense’) is another synonym used to describe habitus, even in English language literature.

Clearly, however, habitus is a process. This means that any description of ‘a’ habitus must be contextualised as a static glimpse (in time and place) of an ongoing dynamic (Pickel, 2005). An individual’s habitus at a given point in time would portray their unique embodiment of experiences up until the point of description, and would differ from their past habitus and future habitus.

Bourdieu considered that people’s foundational habitus is acquired in early childhood, primarily through experiences in family and early educational fields. From these, people form durable dispositions, orientations, and sensibilities, which can continue to regulate their perceptions and responses to any successive life experiences (Bourdieu, 1972, 1998). A person’s habitus is affirmed or challenged in an ongoing way by the habitus of other individuals they encounter, the evolving and various social fields that they occupy during their lifetime (e.g. occupational and class fields), and the normal changes of a person’s life-course (e.g. becoming a parent or ageing).

People perform or express their habitus through their ‘**dispositions**’ or tendencies of practice within their everyday lives (Figure 2). Dispositions, are ‘**embodied**’, meaning that habitus is incorporated into a person’s physical body and expressed through their body in practice in pre-conscious and conscious ways. Examples include the way someone stands, speaks, walks, their facial expressions, the way they perceive things and interact with others, their behaviour and the degree of freedom, obedience, or restraint they demonstrate in their practices (Bourdieu, 1990b; Pickel, 2005). Embodied habitus also includes the embodiment, expression, and exercise of capitals, for example language and skills, which are ingrained into and expressed through the physical body. Thus, habitus offers a “... practical sense for what is to be done in a given situation” (Bourdieu, 1998, p.25), enabling intuitive or preconscious decisions about what “to do or not to do,... to say or not to say”, based on past experiences in social fields, an understanding of what is likely to result from a given action, and the capital capacities to respond accordingly through practice (Bourdieu, 1990b, p.53).

Additionally, habitus is a quality of both individuals and groups. Social groups can have an overarching, dominant habitus, resulting from the collective values, perspectives, and experiences of their members, while individuals within these groups also have their own unique habitus that is a product of their personal biography. Habitus can be shared by groups of different scales and orientations for example families, schools, churches, sports teams, companies, clubs, or event audiences (Kasper, 2009a; Pickel, 2005).

Bourdieu described such groups as ‘**social fields**’. Social fields can be defined as varied, relatively autonomous social spaces or settings that in combination form the context within which individuals practice their habitus. Social fields could also include, for example, home, ethnic group, social class, workplace, economic, political and religious fields, as well as any distinct artistic, musical, or sporting fields that an individual inhabits. The structure of social fields including the boundaries between fields and the position of people within each field are relationally defined by various capitals (economic, social, cultural, symbolic – see below) or power resources that people generate and draw on to pursue their interests, positions, and status within the field. ‘Interests’, Bourdieu defined as anything that motivates and matters to people (Swartz, 1997), and these in turn are influenced by their position in the social hierarchy of the field. Later in this chapter, I discuss some of the different interests that influence contemporary habitus.

Bourdieu’s own research focused on the hierarchy of positions within a given field, and how people struggled to maintain or advance their social positions and status in the field by generating and enacting capitals (see below). Social classes were a particular interest of his. He asserted that people’s positions within social hierarchies are based on the volume of capital they can acquire and command, the relative proportions of each type of capital held, and the way that this capital is ‘invested’ (Bourdieu, 1986).

Four types of ‘**capital**’ were recognised by Bourdieu: cultural, economic, social and symbolic. I discuss each of these in turn below. Individuals, he theorised, pursue the capitals and social trajectories that are regarded as valid within their particular fields to maintain, reconfigure, or advance their position. Thus, he saw capital to be accumulated, invested, converted and enacted by individuals (within and between fields) to influence power relationships and thus maintain or advance their social and class positions (Bourdieu, 1986). For example, in an academic field, individuals pursue publication as a recognised form of symbolic and cultural capital. This pursuit can occur within or across the many fields that one inhabits.

Firstly, people’s possession of ‘**cultural capital**’ is an idea that Bourdieu incorporated into his research in response to observations that children achieved unequally in an educational environment, according to the respective education level of their family (when controlling for social circumstances; Bourdieu & Passeron, 1979; Swartz, 1997). Cultural capital includes all cultural goods and services, and is perhaps more accurately referred to as “informational capital” (Bourdieu & Wacquant, 1992, p. 19, cited in Swartz, 1997). It includes aesthetic preferences and awareness, which stem from the internalised, socialised understandings and appreciations of things like music and art, as well as the related ability to engage with and deploy material objects such as instruments or artworks to display this understanding (Swartz, 1997). In modern market economies, cultural capital also includes institutional education gained, for example, through

schools and universities. Bourdieu considered cultural capital to be perhaps the most important basis of distinction and social stratification in ‘advanced societies’²⁰. However, his studies focused upon French high-society, and cultural capital has less power in portraying the struggle of the middle or lower classes, or larger, more differentiated societies such as those found in the United States (Swartz, 1997).

Secondly, ‘**economic capital**’ describes material wealth (including money and property), and is the most assured, easily transferrable, and universally recognised capital. Along with cultural capital, Bourdieu viewed economic capital to be the most significant informer of habitus in advanced societies (Bourdieu, 1998).

Thirdly, ‘**social capital**’ describes the various social networks a person has, such as group memberships, family ties, friendships, collegial networks, communities, and acquaintances.

Finally, ‘**symbolic capital**’ describes the systems that legitimise the social hierarchy, offering power within the field that is perceived as inherently legitimate (Swartz, 1997) including things like honour, prestige (Bourdieu, 1986, 1990b), institutional degrees, or titles.

Different fields shape what capitals are available or desirable to individuals, and the four types of capital are often inter-linked. For example, an individual might pursue cultural capital in the form of education, and social capital in the form of business networks. These capitals combined might then lead to job opportunities that provide elevated symbolic or economic capitals.

The relationship between habitus, capital, and field was formulated by Bourdieu as an equation²¹. This formula demonstrates how habitus is strengthened or weakened by capital, and how this combined with the social field shape people’s resulting practices.

“**[(Habitus) (Capital)] + Field = Practice**” (Bourdieu, 1979, p.101).

‘**Practice**’ describes both physical human action and the ways that this is routinely performed via capitals (including use of material things, and intellectual and practical knowledge) within social fields, and is the embodied expression of individuals’ dispositions (e.g. intentions, motivations, etc.) (Bourdieu, 1972). All human practice is socialised, meaning that the intersecting actions of individuals within various social fields inform collective practice and vice versa. Thus, practice is also a reflexive process, whereby conscious and sub-conscious thoughts, feelings, etc., are embodied, performed, socially reproduced, or changed as part of the habitus process.

20. Bourdieu refers here to modern, Western, market-orientated societies, which focus on capitalism and individualism, in contrast to (and perhaps at the expense of) the social and symbolic capitals that may be better valued in some indigenous cultures.

21. Albeit devoid of mathematical significance (Crossley, 2003).

2.2.3 Flexibility and durability in habitus

The flexible, but predominantly durable qualities of habitus are also significant elements of Bourdieu's conceptualisation. Another of Bourdieu's many descriptions of habitus is as an acquired system of preferences, principles of classification, and generative schemes of thought and action, which are generally durable over time, but can be applied in flexible ways across various contexts (Bourdieu, 1990b, 1998). This description paints habitus as a flexible set of understandings, dispositions, and practices that an individual can apply to comprehend, act, and interact within the various social fields that they encounter and co-generate. Habitus, as a flexible framework for thought and action, enables the improvisation that people require to negotiate the complexity of human social life.

Lizardo (2004) similarly portrays habitus as a transposable, flexible, but limiting matrix. It is limiting in that it acts as a filter through which perceptions and understandings are seen, and out of which a defined range of practices usually arise. It is transposable in that it can be applied across a range of social fields other than that in which it was formed, and it is flexible, continually adapting within and in response to these fields. Haluza-DeLay's discussion of habitus (detailed later) similarly describes the limitations that a socially contextualised habitus imposes onto people's lives, alongside their capacity to modify it with some flexibility: "We are not creators of our lives, so much as reworkers of the raw materials yielded to us by history and biography" (Haluza-DeLay, 2006b, p.9).

Pickel's (2005) portrayal of habitus further incorporates universal, biological human requirements (e.g. for food, shelter, security, etc.) alongside the psychological (cognitive) schemes and "cultural scripts", that individuals are instilled with and from which practices arise (Pickel, 2005, p.12). Thus, he sees habitus as universal in the way that it addresses biological needs²², but the ways individuals or group go about meeting those needs is determined by their own particular habitus and its particularities (e.g. education, health care, class, etc.). For each different person, the "classificatory schemes" of their habitus distinguish between what is "good and what is bad, between what is right and what is wrong, between what is distinguished and what is vulgar" (Bourdieu, 1998, p.8). Operating on the "basis of acquired equivalences" across the different fields and positions within fields that a person occupies, habitus works at "facilitating the substitutability of one reaction for another and enabling the agent to master all problems of a similar form that may arise in new situations by a kind of practical generalization" (Bourdieu, 1990b, p.94).

22. Later in the thesis, I argue that these biological foundations of habitus must not continue to be taken for granted. The contemporary neoliberal, consumeristic habitus seen especially in Western cities is undermining the natural environment's ability to provide for these foundations at a global scale and cannot be sustained.

Theoretically, habitus can generate an infinite number of practices in a given field via different volumes and configurations of capitals. However, in practice, the dispositions, actions, and interactions of habitus in the field tend to be mediated by an individual's starting position in the field, and tend to endure over time. To any given volume of inherited capital, there corresponds a band of (more or less equally probable) trajectories for the person's life course, leading to more or less equivalent positions (this is the field of possibility objectively offered to any agent). The shift from one trajectory to another often depends on collective events (e.g. wars or other crises), or individual events (encounters, affairs, benefactors, etc.). It follows from this that position and individual trajectory are not statistically independent: "all positions of arrival are not equally probable for all starting points" (Bourdieu, 1979, p.110).

Thus, Bourdieu also viewed habitus as a way of understanding how social structures and associated practices endure and evolve over time. He saw habitus as being generally durable across individual lifetimes and often reproduced perpetually across generations. "The conditionings associated with a particular class of conditions of existence produce habitus, systems of durable, transposable dispositions" (Bourdieu, 1979, p.72).

As well as its durability across a person's lifetime, the relation between habitus and social structures can also be durable over generations (e.g. class fractions). These characteristics are demonstrated in yet another of Bourdieu's definitions of habitus as:

"...systems of durable, transposable dispositions, structured structures predisposed to function as structuring structures, that is, as principles which generate and organise practices..." (Bourdieu, 1990b, p.53).

By 'structured structures' he means the embodied dispositions of individuals that arise from habitus (e.g. playing a musical instrument) which in turn are an internalisation of the social fields in which habitus forms (e.g. coming from a family of music-makers). These dispositions are practiced by individuals within a given social field (e.g. the home), and thereby collectively shape that field, functioning as 'structuring structures' that imbue the habitus of the next generation with similar dispositions (e.g. through social modelling, routine opportunities for practice, financial support, symbolic recognition, etc.). Because the dispositions of each individual's habitus are interlinked with the social field in this way, each influencing the other in a "closed loop", they can be self-reinforcing and thus perpetuated in the field over time (Sweetman, 2003, p.533).

One of the reasons for the durability of habitus in individuals is the way that people's habitus aligns with their social fields - a situation which is said to be 'doxic'. '**Doxa**' is the harmonious habitus-field relationship experienced when the objective, external realities of social life (the field) match up with the internal schema (habitus) of the individual. "...When habitus encounters a social world of which it is the product, it is like a 'fish in water': it does not feel the weight of the

water and it takes the world about itself for granted” (Bourdieu & Wacquant, 1992, p.127). For example, a child with close family ties, inherited dispositions, and appropriate capitals might enact their habitus with ease within the family field. This scenario is doxic because the child’s habitus was formed in this field, and the two align, enabling the child to practice their habitus effortlessly, and feel understood and at ease.

Bourdieu viewed doxa to be ubiquitous, and this is demonstrated in his frequent comparison of habitus to a person’s “second nature” (Jenkins, 2002, p.72) or intuitive “feel for the game” (Bourdieu, 1990a, p.64). A recursive and typically doxic relationship between habitus and field can help to explain why social conventions often go unquestioned.

...When perception is constructed according to the structures of what is perceived, everything seems obvious and goes without saying. It is the doxic experience in which one attributes to the world a deeper belief than all beliefs (in the ordinary sense), since it does not think of itself as a belief (Bourdieu, 1998, p.81).

Bourdieu described this state of acceptance as ‘**illusio**’ - the willing participation in, and unquestioning acceptance of, the ‘rules of the game’. Illusio thus maintains the status quo in a process of social production and reproduction that seldom leads to critical reflexivity²³ (Bourdieu, 1990b, 1998; Lizardo, 2004). When dispositions of habitus are pre-adapted to existing fields, habitus operates conceptually and practically to exclude options that are considered unrealistic or inconceivable, what Bourdieu called the “universe of possible discourse” (1972, p.169), and what people generally consider to be “...just the way things are” (Jenkins, 2002, p.70). Farrugia and Woodman (2015) highlight the depth to which people invest themselves in forms of illusio, or belief in ‘games’ of the social world in pursuit of their ‘ultimate concerns’ or life projects. These beliefs can sometimes be illusory and even unfavourable to the individual, but endure due to their embodiment by individuals and their social embeddedness, which can make ideas, practices, etc., difficult to reflect upon consciously or critically, making change less conceivable. Consequently, Bourdieu saw reflexive, conscious, critical change as rare and exceptional (others’ perspectives follow below).

a) **Habitus, change, and reflexivity**

Bourdieu saw competition between people as a primary driver of change to fields, habitus, capital configurations, and practice. Competition could be for position, status, or distinction in the field or over access and ability to deploy capitals (primarily economic and cultural). Bourdieu was particularly interested in the cognitive structures of habitus that individuals use to distinguish themselves from others. He theorised (and observed) that this distinction is a competitive practice,

23. I.e. active questioning of illusio and interrogation of habitus (whether intentional or imposed).

and saw it as the most significant struggle of any field. For example, in his work on the French upper classes, he looked at how their class-based habitus (and relative privilege) was expressed through demonstrations of their “distance from necessity” (Bourdieu, 1979, p.55). Their consumption of gourmet food, classical music, and highbrow literature, for example, were reflections of their luxury tastes and reflective aesthetics, which distinguished them from the “tastes of necessity” held by the lower (working) classes (Bourdieu, 1979, p.6). He observed that the lower classes, conversely, assessed food by quantity, how filling it was, and how economical it was, and held “popular” tastes in music, “devoid of artistic ambition” (Bourdieu, 1979, p.16). As well as class distinction, habitus can illuminate other durable and evolving social distinctions in society such as gender, age, and occupational position.

Social distinctions also exemplify one way that habitus can be durable across generations, for example, where working-class people produce another generation of working-class people. However, such distinctions can also change over time. For example, this can occur through mobility of people across classes, particularly upward (via increased cultural capital, e.g. education). Additionally, there is continual evolution of distinguishing practices. As one class (or other group in society) begins to emulate the social distinctions of those seen to be above them (e.g. fashion trends or particular sports), these practices no longer serve as distinguishing factors and must evolve. Those at the top of the social hierarchy are forced to innovate, creating or adopting new practices (e.g. of consumption) to maintain their distinction from those seen to be beneath them. For example, routine cigarette smoking in Western countries used to be a habit exclusive to elite men (McCracken, 1990), but was emulated as a symbol of sophistication by upper class women in the 1920s, in their quest for equality (Amos & Haglund, 2000). Later in the century, the upper classes began to forsake smoking entirely in favour of personal fitness regimes (Griswold, 2012). This construct endures, with smoking still seen as an activity of distinction in lower socio-economic groups (Pampel, 2006).

Other mechanisms for change to habitus, field, capitals, and practice include technological innovation (e.g. the rise of affordable smart phones and social media), individual modes of interpreting and enacting capital (e.g. popular culture), natural disasters or ongoing changes to natural systems (e.g. climate change), and evolution of the structures of the field (e.g. political or institutional reorganisation). Additionally, some social fields, notably contemporary Western consumerist societies (with their associated struggles for distinction) are defined, in part, by the value that they ascribe to novelty and the continual pursuit of fashionable change (Sweetman, 2003).

Bourdieu asserted that people do not typically operate using such conscious strategy or rational calculation, a point that has been extensively critiqued (see 2.3, below), but when they do, he called it ‘reflexivity’. Bourdieu’s ‘**reflexivity**’ describes the recursive reproduction (i.e.

incremental, repeated, responsive adjustments) that occurs between individual habitus and field. More specifically, he used reflexivity to describe a person's ability to consciously and critically reflect on their individual dispositions, capitals, practices, etc., and their deployment of these, and to reflect outward to understand how structuring social forces influence them. This equates to a person being consciously aware of the recursive habitus-field cycle depicted in Figure 2, above, and reflecting critically upon the factors involved.

Bourdieu recognised two circumstances where such reflexivity might arise. The first is in times of crisis, when the doxic relationship between field and habitus is ruptured. According to Bourdieu, significant changes to the objective reality of a field, which cause a rupture between the doxa of habitus and field, would be the only circumstance in which ordinary people would become critically reflexive. Bourdieu called such as rupture 'hysteresis'. This could occur when a person is suddenly immersed in a foreign field (e.g. Bourdieu's self-imposed reflexivity through his research in Algeria) or through rapid transformation of a familiar field (e.g. through disasters such as earthquakes, or the collapse of financial markets), whereby people's capitals (or capacity to deploy their capitals) changes, with significant social consequences (e.g. potential loss of home and/or financial security). If the field is transformed, elements of doxa are challenged and elements of habitus may then be contested and adjusted in a process of conscious/critical reflexivity. However, Bourdieu clearly differentiated such crisis scenarios from normal circumstances, where people comfortably embedded in their various social fields respond naturally to a diversity of (sometimes trying) circumstances through plasticity of their habitus and transposable dispositions (Bourdieu, 1990a).

The second occasion where Bourdieu saw potential for critical reflexivity to occur is through its intentional cultivation, in the conscious pursuit of "aesthetics", which he argued is:

"reserved for members of the dominant class, indeed the very top bourgeoisie, and for artists, who as the inventors and the professionals of the 'stylization' of life' are alone able to make their art of living one of the fine arts" (Bourdieu, 1979, p.50).

According to Bourdieu, intentional critical reflexivity otherwise occurred only through the concerted effort of sociologists and other elite intellectuals, in seeking to improve their research practice. This idea resulted from his early fieldwork, where he recognised the discrepancy between the social theorists' models (formal knowledge), which informed his own habitus, and on-the-ground cultural practices (practical knowledge) - a discrepancy that piqued his self-reflexivity. He thereafter argued that the role of researchers encourages, if not demands, critical self-reflexivity upon their own habitus and related social structures that affect their research (Swartz, 1997). This includes considerations such as personal interests, researcher's relation to research participants, and their theoretical and ideological motivations. After all, he considered,

research is an interested pursuit by intellectuals who seek to advance their position within intellectual fields through research practice.

Bourdieu saw this kind of reflexivity and any associated changes that an individual could consequently make to their habitus as a way of amending subjective reality (Jenkins, 2002). He viewed the self-questioning of critical reflexivity as a way to bring habitus to “...the level of consciousness” and develop “new facets of the self” (Reay, 2004, pp.437-438) in an “awakening of the consciousness”, again occurring mainly in elites (Bourdieu, 1990a, p.116). Nevertheless, Bourdieu maintained that the potentiality of *any* situation is regulated by the embodied dispositions of individuals and the constraints of existing fields, which just reinforces his position that habitus is primarily conservative (Bourdieu, 1990b, 1998), and “beyond the grasp of consciousness” for most people, most of the time (Bourdieu, 1972, p.94).

2.3 BUILDING ON BOURDIEU: CONTEMPORARY HABITUS AND REFLEXIVITY

Bourdieu’s concepts have been critiqued and developed extensively over time. One aspect that has been widely developed, including in this thesis, is this notion of reflexivity and the ways that habitus can be changed. Bourdieu’s acknowledgment of intentional change was contextualised primarily within 1960s French society where he generally regarded change as exclusive to the higher echelons. However, it is argued that in contemporary society, individuals are more inclined to invoke conscious reflexivity, and to comprehend and deliberately change aspects of their habitus.

For example, Reay describes Bourdieu’s limited attribution of reflexivity as “anti-rational” (Reay, 2004, p.438), and Sayer (2005) additionally critiques Bourdieu’s marginalisation of “the life of the mind” in non-academics and other ‘non-reflexives’, emphasising the significance of daydreaming, ruminating, and conscious reflection in ordinary people’s day-to-day life, and asserting that people can deliberate on, and “strive to change their own habitus” (Sayer, 2005, pp.29-30). While Bourdieu is perhaps accurate in his assertion that most people’s habitus is not typically inclined to *rapid* transformation, he does acknowledge that habitus continues to adapt. Swartz (2002, p.66S) refers to this as an “elaboration” of established dispositions. However, others are more categorical about how much habitus can change:

While habitus reflects the social position in which it was constructed, it also carries within it the genesis of new creative responses that are capable of transcending the social conditions in which it was produced (Reay, 2004, pp.434-435).

This suggests that intentional change and novel development of habitus is entirely possible. Farrugia and Woodman (2015, p.2) concordantly assert that “habitus is best understood as a generative mechanism for producing socially embedded creativity”. This is far from any simple, deterministic consideration of habit and routine. Thus, many modern scholars consider that habitus is founded in the raw experiences and opportunities afforded to individuals, but there is room for movement and differentiation in each individual’s reworking of their practices, dispositions, expressions of capital and overall habitus, or a continual “process of learning” (Haluza-DeLay, 2006b, p.13). This description alludes to Haluza-DeLay’s research findings that practical and critically reflective education (in the context of environmental social movement organisations) can promote routine reflexivity and intentional change to habitus. Sayer (2005) similarly argues that a process of trial and error is required when acquiring a ‘feel for the game’, and that any practice in the field necessitates motivation and concentration, and therefore degrees of consciousness, to begin with at least.

Furthermore, far from Bourdieu’s original assumptions, it is now argued that conscious and even critical reflexivity is a routine part of modern social life. For example, Crossley (2003) contends that reflexivity is not limited to fleeting periods of crisis or to intellectuals, but that it is routinely practiced by activists in durable social-movement fields such as pacifism, feminism, environmentalism, and animal rights. He asserts that activists acquire a unique habitus through such participation (e.g. in peaceful protest), in addition to their primary familial and educational socialisations, and that their pursuit of social change promotes reflexive dispositions such as political self-interrogation and routine self-change. What is more, this proclivity for analysing, critiquing, comparing, and seeking to improve the status quo (of societal norms, but especially of self), is further observable in the general population, with the rise of self-determined image-creation that is promoted, for example, through social media, reality TV, celebrities, self-help books, and the fitness industry. Indeed, Sweetman (2003) defines the modern habitus, particularly of the tertiary-educated, professional middle classes, as inherently (critically) reflexive.

In accordance with Bourdieu, the modern habitus reflects modern social fields. However, the social fields (and ‘rules of the game’) of the 21st century are continually and rapidly changing (economically, socially and culturally), essentially creating a ubiquitous crisis of doxa, and therefore necessitating continual reflexivity (Giddens, 1991). For example, compared to the era of Bourdieu’s research, today’s more liberal education promotes greater critical self-reflection. The reasons behind this include occupations becoming more pluralistic and less circumscribed; people moving across fields more frequently; the weakening of community relations; globalisation and associated forms of trans-preferentiality; the increasing availability of scientific and other forms of knowledge (which are also rapidly evolving and continually being contested); and consumer culture coupled with big media, which promotes aspirational, fashionable change, and associated projections and performances of self-identity.

Sweetman (2003) argues that these characteristics of modern society generate uncertainty in social fields and self-consciousness in habitus, thereby necessitating routine conscious reflexivity. As Sweetman points out, people can decide to change independently of their fields (e.g. how they dress, speak, or their interests). Giddens (1991) furthermore sees the modern habitus as a constructed self-identity project, pursued with perpetually critical reflexivity. Bourdieu himself describes a similar phenomenon, of much more limited scope, in his own research of the French *petit-bourgeoisie*, whose aspirational existence corresponded with an uneasy, continually reflexive habitus.

2.4 DEFINITION AND USE OF ‘REFLEXIVITY’ IN THIS THESIS

Through my literature review, I found that the term ‘reflexivity’, is often applied ambiguously or with the assumption of understanding. This is often the case when it is applied without reference to habitus, but also occurs in Bourdieuan literature. Some uses apparently analogue it with ‘reflex’, an inadvertent, fixed reaction, while others align it with ‘critical reflection’, involving intentional criticality. To unpack this disparity, I define what I mean by reflexivity itself and delineate three types of reflexivity that occur along a spectrum, and which I refer to within this thesis.

Considering reflexivity as a combination of reflection and recursion (Hibbert, et al., 2010) enables the full spectrum of reflexivities that are discussed in the literature to be understood. ‘Reflection’ is a mental process of recognising what *is* (e.g. awareness of the environment around you, your own practice, etc.) and can be subconscious, unquestioning, and/or self-contained observation through to conscious and critical questioning (e.g. of what is, or what could be). It can even include invitation of critique from others (e.g. as in reflective-practice). ‘Recursion’ is the process whereby one cycle of a process successively influences the next. Recursion can be passive, for example in Bourdieu’s depiction of habitus as an often unquestioned cycle of successive mutual influence between individuals and the field; or active and intentional (i.e. when people intentionally seek to change).

Thus, reflection and recursion can be conceptualised independently, but ‘reflexivity’ involves consideration of both (Hibbert, et al., 2010). Different types of reflexivity can occur in different configurations within the same person. For example, a person might be more critically reflexive about their work-life, interior design, socio-economic status, sporting-life, and social-media presence, but subconsciously reflexive about their height, accent, language, race, sexuality, and environmental footprint, or vice versa. Different types of reflexivity can also occur in different temporal forms (e.g. routine, periodic, or sporadic). I define three key types of reflexivity along a spectrum, for the purposes of my discussions herein. Evidently there are many other variants, and literature on these abounds (see review in Chapter 7).

The first type I discuss is **subconscious reflexivity**, which is a fundamental part of every habitus, and constantly occurs with reference to many aspects of everyday life. This reflexivity comprises the often passive, ongoing micro-adjustment and attunement of habitus (including dispositions, practices, and capitals) to the surrounding social field. This includes confirmatory modes of reflection, where life is considered through established mental/theoretical lenses, leading to reinforcement and reproduction of the same patterns of practice and thought (Hibbert, et al., 2010). Such reflexivity routinely occurs within accustomed social fields, where individuals are within their comfort zone, guiding ‘normal’ everyday life without conscious thought and maintaining doxa between habitus and field (see 2.2). For example, someone accustomed to life in a large Western city might negotiate their way through a busy pedestrian area with subconscious reflexivity (i.e. without having to make conscious decisions or becoming overwhelmed), and in accordance with others doing the same in the same field. Of course, change still occurs as a routine part of subconscious reflexivity; but it is a more passive response to incremental changes in the field compared to the other forms of reflexive change described below. This by no means implies that habitus is wholly ‘unconscious’, or that it cannot be raised to the realm of awareness or changed with intent; but that it can, at times, be purely dispositional, routinised, and go unquestioned as Bourdieu theorised (see above). The distinction is not concrete, and is made here for the purpose of theoretical analyses, and to illuminate the potential spectrum of reflexivities that occur, but are not well acknowledged in the literature.

The second type of reflexivity is **conscious reflexivity**. This kind of reflexivity involves conscious reflection, noticing how things ‘normally’ occur in the social field, potentially questioning these, and actively deciding how to respond to this reflection in practice. This can lead to intentional change (i.e. adjustment) to habitus, dispositions, and capitals, in accordance with (or opposition to) the doxa of the social field. Such conscious reflexivity can be active and intentional (i.e. self-imposed), and occur in a routinised way involving everyday changes and ordinary life-course decisions (as many scholars argue is the modern norm, see above), or in a periodic way (e.g. when contemplating New Year’s resolutions). It can also be imposed involuntarily in a routinised way (e.g. in marginalised populations; and due to aspects of modern life such as peer-pressure), or a periodic way (e.g. occurring as a crisis response to dramatic changes in the social field as discussed above, or changes in life stages such as ageing). It can also be a combination of these, for example, immersive international travel could involve intentional conscious reflexivity at the time (e.g. exploring another culture), as well as spurring ongoing, unintentional conscious reflexivity (e.g. culture shock when travelling and/or returning home).

The third strain of reflexivity, often discussed in the literature as a specific methodological research approach, is **critical reflexivity**. At the far end of the spectrum this involves intentional and intense introspection equivalent to observing and analysing all parts of one’s own habitus (or potentially that of others), including how the various parts of habitus continually co-construct one

another, thereby exposing *illusio* (i.e. ‘the rules of the game’). This is the ‘awakening of the consciousness’ that Bourdieu attributed to intellectuals, viewed as a cultivated skill, and practiced himself as a research methodology. This kind of reflexivity can be intentionally strengthened. For example, through concerted self-reflection (i.e. psychoanalysis), or immersion in a foreign field that, through contrast, highlights various aspects of *habitus* that are usually taken for granted.

As a contemporary research practice, this involves examining presuppositions around epistemological beliefs and assumptions, theory, and/or methodology, and the forces that shape these (e.g. political, and social). It can even be adopted as a ‘hyper-reflexive’ in-the-moment methodology of deconstructing, reassessing, and revising praxis²⁴ (Ryan, 2005). Just as Bourdieu did, many researchers see such ‘reflexive-methodology’ or ‘reflexive-practice’ as a means of unveiling and accounting for their bias and consequently enhancing the validity of their research or praxis. Moreover, it can spur new ways of thinking and asking questions, open researchers up to new theories, and recursively strengthen capacity for critical reflexivity itself (Hibbert, et al., 2010). Intentional critical reflexivity can be undertaken periodically or become relatively routinised (e.g. in researchers who intentionally practice reflexive methodology). Despite this, critical reflexivity can be a deeply uncomfortable process, especially when the practice is unfamiliar, is imposed (e.g. during immersion in a foreign field), or involves critical analysis by others (Allen, et al., 2017; Hibbert, et al., 2010).

As discussed above, critical reflexivity is also common in (and imposed upon) those holding a marginal position within the field (Haluza-DeLay, 2006a), and those within a field that is characterised by routine critical awareness such as environmental activism groups (Crossley, 2003; Haluza-DeLay, 2008), as well as being omnipresent in contemporary Western society at large (Sweetman, 2003).

In this thesis I discuss, develop, and apply the idea of ‘**ecological reflexivity**’. Ecological reflexivity (ER) is to ecological *habitus* as reflexivity is to *habitus* (see below). It can be subconscious through to critical in the same ways, and describes the way that an individual subconsciously and routinely adapts to the ecological world, one’s periodic, conscious reflection upon these interactions, or an intentional and critical examination of socio-ecological interactions and consequent, intentional change. I propose that the critical variant of ecological reflexivity (critER) offers a way to engage ecological *habitus* as an optic for socio-ecological research in the same way that Bourdieu used *habitus* as a sociological tool. I develop this idea theoretically in Chapters 6 & 7.

24. I.e. theory-informed practice, such as teaching.

2.5 REVIEW OF ‘ECOLOGICAL HABITUS’

Habitus has remained a compelling research concept into the 21st century, with publication of over 5,180 articles referencing the topic since 2000, including adaptations of habitus across 28 different subject areas²⁵. Much of the modern literature based on English translations of Bourdieu’s work has focused on his examinations of class, taste and consumption, education, and the social stratification and power relations surrounding these (Lizardo, 2004). Most significantly for this thesis is the recent adaptation of habitus for socio-ecological research. Next, I review this literature on ‘ecological habitus’, discussing definitions and concepts that I employ in this thesis where pertinent.

2.5.1 General background of ecological habitus

Ecological habitus describes the sum of all the ecologically relevant aspects of any habitus (e.g. facets of water, food, and energy use; waste creation; life activities; economic behaviour, etc.). A brief example of what constitutes an individual’s ecological habitus at a point in time is provided in Appendix 1, using myself as an example.

Environmental philosopher Mick Smith (2001) first used ecological habitus in describing ethical environmental practice, condemning the environmentally destructive reigning paradigms (and corresponding practices) of contemporary societies, while highlighting the creative, constructive, and holistic potential (conceptually and practically), of an ecologically-positive habitus in everyday life.

Since then, ecological habitus has been similarly adopted by other researchers as a tool for examining (and potentially changing) social structures and practices to address environmental issues. Applying habitus to understand people’s ways of life and promote directional change contrasts with Bourdieu’s own descriptive (positivistic²⁶/value-neutral) use of habitus, but is increasingly common in literature that draws on his ideas. Such change-making applications correspond with contemporary attributions of routine reflexivity and a degree of agency in the construction and change of habitus to the mainstream²⁷ of people, as discussed above.

25. Bibliometrics retrieved from Scopus database, March 2018, based on a search for published ‘articles’ containing ‘habitus’, from the year 2000 onwards. In the three years since 2015, the number of articles resulting from this search has grown by more than 1,500.

26. I use ‘positivistic’ throughout this thesis in the sense of positive theory (e.g. in economics) to mean relatively ‘objective’ or value neutral. This is distinct from ‘positive’ (i.e. constructive or desirable).

27. I use ‘mainstream’ to describe dominant (i.e. ‘normal’) trends, groups of people etc. (e.g. unsustainable ecological habitus is ‘mainstream’ in cities, as defined by per capita ecological footprints).

The concept of ecological habitus has been adopted by several different disciplines (albeit in a limited quantity of research) in recent years for its descriptive and/or change-making applications. These include ecologically motivated social change to support health promotion (Poland, et al., 2011), development of an alternative ecological epistemology in the literary arts (Chisholm, 2011), changing consumption patterns in response to climate change (Shwom & Lorenzen, 2012), ‘green’ lifestyles and consumption (Lorenzen, 2012; Lorenzen, 2014), and New Zealand reality television as a form of eco-media (Pearson, 2015).

Furthermore, Carfagna and colleagues (2014) label it ‘eco-habitus’ in their research into ethical consumption and distinction, and this term has since been cited in further studies on consumption (Eli, et al., 2016), including studies of energy (Bartiaux, et al., 2016; Boucher, 2017) and gifting (Aptekar, 2016). Other research uses ‘habitus’ to similar ends without discussing ecological habitus per se, for example within research on habitus and identity within emergent urban forms (Knox, 1991), habitus and constraints to environmental citizenship (Horton, 2006; Szerszynski, 2006), and the practice of sustainable lifestyles (Evans & Abrahamse, 2009).

Of particular significance to this thesis are four scholarly works that contribute significantly to my development of ecological habitus theory. The rest of this section is organised around these and draws on further literature where relevant. First, I review Haluza-DeLay’s extensive works on ecological habitus (2006a, 2006b, 2008), followed by a review of Karol and Gale’s (2004) similar concept - ‘habitus of sustainability’, Kasper’s (2009a) conceptual/methodological proposals for ecological habitus, and Gäbler’s (2015) proposal for the concept as a socio-ecological transformation optic.

2.5.2 Haluza-DeLay’s place-based ecological habitus and supportive social fields

Elaborating extensively upon the budding notion of ecological habitus provided by Smith (2001), Haluza-DeLay defines ecological habitus as “a routinely ecologically attuned lifestyle” (2006b, p.6) or “practices of reducing ecological impact and living socially and ecologically well in place”²⁸ (Haluza-DeLay, 2006b, p.11). This definition foregrounds the significance of specific ecological contexts and social fields in shaping the lived, everyday practice of ecological habitus (as opposed to others’ more abstract conceptualisations, outlined below). Haluza-DeLay argues that recognition of both social fields and contexts (e.g. familial, economic, religious, and historical) and specific material/ecological contexts (e.g. landforms, weather, ecosystems, and animals) are needed to fully conceptualise how ecological habitus forms and evolves.

28. This is a necessarily broad definition, as ecological habitus is contextually specified in the same way as Bourdieu’s habitus. The additional descriptions and examples that follow will further clarify the ways that ecological habitus can be conceptualised and applied.

He describes this multifaceted social-ecological context, within which ecological habitus emerges, as “place”, asserting that (forms of sustainable) ecological habitus necessarily include a “sense of place” and sense of what practical form such an ecologically and socially harmonious lifestyle might take *in a given place* (Haluza-DeLay, 2006b, p.11); and Code (2006) perceives the same place-basedness in habitus more generally.

Universally applicable rules for living well in every place could not exist. What is suggested instead is a *modus vivendi*, a *sens pratique*, [where] ... the practices generated by ... ecological habitus are attentive to its place as a socioecological milieu (Haluza-DeLay, 2008, pp.213-214).

Thus, the *modus vivendi* (another descriptor of a socially reflexive ‘way of life’ or ‘mode of living’; see Archer, 2012) or *sens pratique* offered by ecological habitus enables individuals to respond appropriately to the social and ecological conditions within which it is practically enacted. For example, the embodied ecological habitus of someone living in an arid country (e.g. Australia) and striving for sustainability might involve the routine and reflexive practice of strict water conservation (e.g. limiting shower duration or flushing of toilets), while such practices might be less significant in water-abundant countries (e.g. New Zealand), where other practices might be more significant (e.g. cleaning boots, boats, and other equipment as part of biosecurity control²⁹).

Haluza-DeLay’s discussions focus on ‘sustainable’ or ecologically-positive forms of ecological habitus exclusively. However, the concept of place-basedness can be applied equally to alternative forms of ecological habitus (e.g. ecologically-harmful, unsustainable, ambivalent, or apathetic). Pearson (2015) offers an example of less environmentalism-centric place-based, describing how people interacting routinely with ecological phenomena in New Zealand (e.g. by hunting in the forest or swimming in the ocean) embody ecologically relevant capitals (i.e. skills and knowledge) through these practices that are valuable and necessary for their performance of ecological habitus in place. However, the same individuals, deploying the same capitals as part of ecological habitus in another place (Paris and Beijing are exemplified) might find them to be “[not] particularly advantageous or seem especially natural” (Pearson, 2015, Box 7.3). This exemplifies how in different places, different ways of interacting with the natural environment are needed. Thus, embodied ecological habitus and its practice, while flexible to a degree, can be linked inextricably to the particular material/ecological context (ocean, river, forest, city, etc.) where habitus develops or is typically practiced, in much the same way as habitus is linked to formative and everyday social fields.

Like Bourdieu’s habitus, ecological habitus involves both flexibility and creativity (i.e. it is non-prescriptive). However, it is also constrained (in this case with regards to the ecological contexts and

29. E.g. to prevent biosecurity threats such as ‘didymo’ (*Didymosphenia geminata*) and kauri dieback disease (*Phytophthora agathidicida*).

consequences of one's actions). This is equivalent to the 'feel for the game' described by Bourdieu, which responds innovatively and creatively to the social world, but is nonetheless constrained by the specific conditions of its genesis and fields of practice.

The significance of this place-basedness is further highlighted when considering people's relationships with 'nature' (i.e. ecology) as part of a sustainable ecological habitus. Such relationships develop in a place, and even more abstract, depersonalised concerns of ecological habitus such as energy conservation are somewhat place-reliant (rather than ubiquitous). Correspondingly, developing a sense of nature-connectedness and caring; and an understanding of socio-ecological interdependency is a core tenet of environmentalism (Barnhill, 1999; Lake, 2010; Louv, 2011; Smith, 2001; Suzuki, 2007 [1997]), and familiarity with specific places (e.g. a garden or park) is seen as an important factor in this (Beatley, 2011; Clayton & Opatow, 2003).

Tying of place-based ecology to self is also evidenced in many indigenous cultures, where routine practice of ecological habitus occurs within the particular context of local ecologies (and facets of ecological habitus are often culturally foregrounded). For example, the place-based notion of 'tūrangawaewae' (roughly translating as 'place to stand') of New Zealand Māori links people's ancestral origins and identities not only to social groups (tribes or 'iwi' and subtribes or 'hapu') but also to specific landforms such as mountains and rivers (e.g. Smith, 2004). This contrasts with the orthodox and 'unsustainable' ecological habitus of contemporary Western society, where the "imperial mode of living" (Brand & Wissen, 2012, p.1) favours dominating and exploiting both people and ecology at far reaching scales. This abstracts or divorces people's everyday experiences from ecologies of particular places (and the natural environment in general), precluding the embodied-experience of ecology-in-place that is discussed above.

Particularly, Haluza-DeLay's exploration and exemplification of (sustainable) ecological habitus focuses on the social fields of environmental organisations. These, he argues, are charged with challenging the socio-ecological status quo, offering a vision for desirable alternatives, and demonstrating the practical application of these alternatives (Haluza-DeLay, 2008). He applies ecological habitus to theoretically frame this argument. The dilemma in creating wider social change towards more ecologically sound practices, Haluza-DeLay postulates, lies in the recursive nature of habitus and the field, which reproduces the dominant, environmentally unsound norms of modern society (Haluza-DeLay, 2006b, 2008). To progress beyond this impasse, he asserts, requires adjusting habitus and field simultaneously, and he presents environmental organisations as sites where this two-fold intervention can occur.

Such organisations present opportunities for social and experiential learning (see Le Cornu, 2005), operating as 'communities of practice,' that provide routinized environmentally-sound practical experiences and application of knowledge, in addition to the cognitive aspects of learning (Haluza-DeLay, 2006b). The environmental movement has suffered because the links between the portrayal

of environmental issues and “what real people do in real life” have been neglected, according to Haluza-DeLay (2006b, p.2). Therefore, recognising the principles of ecological habitus and particularly the role of everyday practice could enhance environmental organisations as situations of social learning. Developing and routinising new practices in such pragmatic ways within everyday social settings could change individuals’ ecological dispositions over time, thereby modifying their habitus (in procurement and deployment), and potentially introducing this positive change into other social fields.

Haluza-DeLay argues that supportive social fields can furthermore reinforce positive-ecological habitus and support this through doxa. Thus, environmental organisations may provide such social spaces where people’s ecological habitus can develop, and where it makes practical sense. They offer the doxic field necessary for the incubation of environmental practices until they become routine, embodied dispositions of the individual, and part of a broader ecological habitus that can resonate across the other social fields of people’s lives (Haluza-DeLay, 2008).

An example of this is a Canadian permaculture network (Haluza-DeLay & Berezan, 2013), where individuals who have studied and practiced permaculture maintain contact and routine communal practices to support and grow their ecologically sustainable dispositions. In this instance, there is not one specific location where the practice occurs, or a united and fixed social group, but rather a “distributed eco-village” from across the region that forms and disbands variously for short-term events of mutual interest and for ongoing learning (Haluza-DeLay & Berezan, 2013, p.139). The social field, where common values are held, is maintained by this periodic joined practice (e.g. weekend workshops or working bees), and is supported in the interim through digital communication.

Before publishing her adaptation of ecological habitus, Kasper (2008) conducted similar research into the lifestyle support offered by ‘eco-villages’³⁰, with concurring conclusions (discussed below). As a social field orientated to ecologically sustainable lifestyles, eco-villages support sharing of knowledge, opportunities for ecologically sound practical experience, emphasis on reflexivity, and a harmonious social field in which ecological habitus can develop. Moreover, eco-villages can support this on a comprehensive, day-to-day basis, both socially (e.g. through governance systems and philosophies, workshops, meetings, conferences, shared meals, and work projects) and materially (e.g. through sustainable systems of food production, infrastructure, ecosystem conservation, and construction of homes; Kasper, 2008). Finally, eco-villages offer objective, material conditions that support such lifestyles through deliberate design, for example shared facilities for recreation (e.g. naturalised swimming pools) and amenity activities (e.g. gardening and composting), space reserved for wildlife, and construction that prioritises recycled materials, solar energy, or waste minimisation.

30. Eco-villages are communities intentionally designed to have small ecological footprints (creating or exceeding sustainability).

This is another example of how ecological habitus is situated within specific social, material, and ecological ‘places’ and how these inform its development and enactment.

While participating in alternative, ecologically-orientated social fields of these kinds can enhance ecological habitus in individuals by disrupting the everyday reproduction of dominant ecologically unsound habitus (Haluza-DeLay, 2008) and making sustainable alternatives seem normal and easy, upholding ecological habitus within the social structures of other (e.g. inherently ecologically harmful/unsustainable fields) requires greater reflexivity on behalf of individuals and benefits from supportive social structures. Accordingly, Haluza-DeLay asserts that environmental organisations must also facilitate people’s reflexivity of the nature of habitus and field, the power of *illusio*, and how this conserves dominant social paradigms; and must critique the social structures of the mainstream that inhibit sustainable ecological habitus (Haluza-DeLay, 2006b).

Concluding his study on environmental social change organisations, Haluza-DeLay claims that individual ecological habitus and change to wider social norms can be cultivated through practical learning, supportive social fields, and development of ecologically attuned reflexivity within individuals. He affirms that the intentional cultivation of sustainable ecological habitus is possible, and suggests that if this was proliferated it could serve as a counter-hegemonic tool for contesting the legitimacy of environmentally unsound practices (Haluza-DeLay, 2008). I explore further how such ecological habitus might be cultivated in the mainstream of city people in Chapters 9 & 10.

Reflecting on Bourdieu’s formula for habitus and practice (see end of 2.2.2), Haluza-DeLay’s works focus on the role of social fields, everyday practice, and dispositions in swaying ecological habitus. He only briefly mentions capitals (specifically symbolic capital, and naming/recognising socio-ecological efforts). Complementing this is a convergent, but completely independent strand of research (not citing, or cited by any other ‘ecological habitus’ scholars), where Karol and Gale (2004) elaborate on the role of ‘environmental capital’, both material and embodied, in creating a ‘habitus of sustainability’. Karol and Gale’s research sits within Bourdieuan education literature, which is a large but specialised field of research unto itself. The siloed³¹ publication of habitus research may explain the separate³² evolution of these similar concepts.

31. The term ‘silo’ is applied in the literature to describe a unit, especially a discipline, which is separated from others, as discussed at length in Chapter 8. Silos can inhibit the whole-systems understandings that are necessary for sustainability, making them an increasingly popular research topic. Bourdieuan research as a whole is not siloed (i.e. it is discussed in different disciplinary literatures), however these discussions can be siloed from one another (e.g. within independent publications dedicated to education, anthropology, or marketing). Reviewing ecologically relevant Bourdieuan concepts from within such silos, rather than across them, may explain the separate evolution of ‘ecological habitus’ and ‘habitus of sustainability’, for example.

32. Haluza-DeLay, Kasper, and other recent ecological habitus scholars cited herein do not make reference to Karol and Gale’s ‘habitus of sustainability’; neither do Karol and Gale cite Mick Smith’s earlier work.

2.5.3 Karol and Gale's 'habitus of sustainability' and 'environmental capital'

Karol and Gale's (2004) "**habitus of sustainability**" describes "an awareness of the interconnectedness of nature and humanity", providing a lens through which everyday decisions can be assessed, rejecting those "which may otherwise provide economically, culturally or socially, if the environmental consequences are too severe" (Karol & Gale, 2004, p.9). This describes a desirable endpoint and focuses on means of shifting habitus towards this, corresponding with Haluza-DeLay and Smith's normative definitions of ecological habitus.

In this thesis, I describe this value-based concept (i.e. ecologically/environmentally-positive/sustainable habitus) as '**sustainable ecological habitus**' to avoid ambiguity. 'Ecological habitus' does not describe what *kind* of relationship with ecology is being implied (sustainable or unsustainable - although often it is the former), while 'habitus of sustainability' does not describe what is being sustained. Thus, sustainable ecological habitus is a habitus that includes aspects of, or privileges, ecological sustainability.

Karol and Gale's work focuses on training pedagogues to instil lifelong ecologically sustainable dispositions and practices in forthcoming generations (Karol & Gale, 2004). They present '**environmental capital**' as a way of describing capitals of relevance to ecological sustainability. Their primary argument is that education of and by such pedagogues ought to include environmental/ecological capital to a greater extent. Their 'environmental capital' comprises cultural capital with sustainable ecological relevance (e.g. knowledge, understandings, and skills), as well as relevant economic³³ capitals (e.g. electric cars and solar panels). Others have discussed ecologically sustainable consumption practices in creating distinction (e.g. Carfagna, et al., 2014; Lorenzen, 2014), which equates to enacting forms of environmental capital.

Hereafter I describe these kinds of capital as '**ecological capitals**'; again, I use this phrasing rather than 'environmental capital', because ecology is a more precise term than environment. Additionally, this is more in keeping with my use of ecological habitus as a lens for observing factors of habitus that have ecological salience. I contend that ecological capital includes any of Bourdieu's capitals (cultural, social, economic, and symbolic) that have ecological salience. For example, participating in environmental groups constitutes ecological social capital and symbolic measures such as ecological foot-printing analysis or LEED³⁴ certification could constitute ecological symbolic capital. In addition to gaining ecological capital through early education, which Karol and Gale advocate for, it might also be gained through experience (Horton, 2006), or

33. In Bourdieu's four-capital model of habitus, these fit well under 'economic capital', but could also be seen as material, physical, or symbolic capitals etc., depending on the lens applied.

34. LEED (Leadership in Energy and Environmental Design) is a building certification system devised by the United States Green Building Council to denote environmental performance and sustainable design. Similar certification systems include ISO sustainability certification (in Europe), BREEAM (Building Research Establishment Environmental Assessment Method) in the UK, and Enviro-mark in NZ. All constitute ecological symbolic capital.

socially ‘caught’ (Haluza-DeLay, 2006a), being absorbed through social-modelling rather than structured education. Later in the thesis I develop the argument that natural capital is another overlooked but integral part of ecological habitus (Chapters 6 & 9).

The above examples of ecological capital are from the sustainable end of the ecological habitus spectrum, but again, ecological capital might technically describe capitals of other (e.g. unsustainable or neutral) forms of ecological habitus. Pearson’s (2015) examples of outdoor pursuits demonstrate this. The physical, embodied capabilities needed to interact competently with specific ecological settings (e.g. ability to swim in the open ocean) can be viewed as forms of ecological capital that are relatively unconcerned with ecological sustainability. Pearson exemplifies tourists’ incompetence when swimming on New Zealand’s volatile coast (e.g. at Raglan or Piha), which necessitates a different embodied form of ecological capital than swimming in the tranquil waters frequented by travellers in other parts of the world.

Returning to ecological sustainability, Karol and Gale (2004) highlight that the pursuit of ecological capitals is a far less arbitrary ambition of habitus than many others that have been the focus of recent history (e.g. material affluence, power, etc.), as they potentially contribute to collective (and almost universal) benefits, in addition to any individual’s gain.

While action in the past may have been oriented towards wealth, prestige, recognition, or truth, environmental scientists posit that in the future the stakes could be either sustainability or destruction, put simply, life or death (Karol & Gale, 2004, p.2).

This aligns with other critiques and updates to habitus for the modern world, where the ‘interests’ that motivate people and inform habitus come from commitment, not just convention, and can contribute to altruistic struggles as well egotistical ones (Sayer, 2005). Significantly, Bourdieu’s conceptualisation of capital was founded in economic terminology (e.g. games, investments, and capitals) that separated his conceptualisations from the biological and psychological truths of human embodiment (Sayer, 2005). However, these are of particular significance when considering the role of ecological capital. Bourdieu primarily viewed capitals as power resources, portraying “egotistical, instrumental, ... competitive and reward seeking” motivations for acquiring capital (Sayer, 2005, p.39), although these are simultaneously preconscious and practical. However, realistically, people do not just ‘have an interest’ in things for egotistical reasons, or for the betterment of their capital estates, but are ‘interested in’ things (people, projects, etc.), and are emotionally invested in them because they affect social wellbeing and happiness (Sayer, 2005). Sayer reasons that capital (e.g. friends, skills, etc.) can additionally be invested to altruistic ends, and that there is a normative (and correspondingly ethically reflexive) element in the causes that people commit to. I argue herein that this is also true (and ought to be more so) for ecological sustainability and investments in ecological (and natural) capital.

2.5.4 Kasper's conceptual/methodological ecological habitus

Another key ecological habitus scholar is Kasper (2009a) who presents ecological habitus from a more value-neutral, theoretically-abstract perspective than Smith, Haluza-DeLay, or Karol and Gale, proposing it as a conceptual tool/methodology for holistic socio-ecological research. She explains that traditional approaches to studying socio-ecological interactions have focused on defining the effects of independent, quantifiable variables, such as attitudes, knowledge, beliefs, values, demographics, religion and other situational or external factors, and how these affect environmental behaviour, with the aim of developing predictive models and uncovering universal truths about human-environment behaviour (Kasper, 2009a). These models have failed to portray the dynamic realities of human behaviours as processes, and more importantly for socio-ecological research, fail to reflect the complex relations between humans and their wider biophysical contexts.

Recently, more holistic conceptual models that recognise the interconnectedness of these variables, as well as structural and institutional impacts, have been developed. These include, for example, scales that gauge connectedness to nature, ecocentrism, and endorsement of alternative environmental paradigms (obviously these build on the established notion of systems-orientated theory [e.g. Von Bertalanffy & Rapoport, 1956]). Despite these developments, detrimental socio-ecological relations pervade, and Kasper argues for more comprehensive counter-hegemonic intervention. In order for social science to maintain relevance within wider ecological research, she argues, conceptual tools that recognise the complex interdependence of human social life with the “web of nature” are required (Kasper, 2009a, p.315).

She offers ecological habitus as one such conceptual tool, for understanding environmental practice as a product of individuals' biographies and as a reflection of their unique social and environmental contexts. Accordingly, Kasper defines ecological habitus as the:

... embodiment of a durable yet changeable system of ecologically relevant dispositions, practices, perceptions, and material conditions -perceptible as a lifestyle - that is shaped by and helps shape socioecological contexts (Kasper, 2009a, p.318).

Environmental behaviour, she argues, is a manifestation of ecological habitus and its myriad socio-ecological interactions, rather than the predictable result of individual, deterministic variables, as suggested by the conventional models that she argues are obsolete. Ecological habitus describes the network of ecologically relevant dimensions of habitus, and can thus be thought of as a subset of total habitus. Kasper (2009a) lists these ecologically relevant dimensions as including: habitat, water, food, energy, waste, life activities, economic behaviour, identity, beliefs, and future goals. Haluza-DeLay additionally includes classic social dimensions of habitus (e.g. class composition, ethnicity, religion) and “landforms, weather, distance to energy sources,

ecosystems, watersheds, endangered species, animals”, etc. (Haluza-DeLay, 2006b, p.213). These dimensions and the relations between them are integral parts of ecological habitus, and as with habitus, the dispositions of ecological habitus are shaped by, and go on to shape these social fields, and significantly, also shape biophysical, ecological environments.

As a proposed research tool, Kasper defines ecological habitus as a value-neutral descriptor, which can frame any set of dispositions or lifestyles on a spectrum from ecologically supportive to ecologically antagonistic (Kasper, 2009a). Kasper’s ecological habitus, accordingly, does not describe a ‘thing’; rather it is a way of conceptualising the myriad socio-ecological relations of day-to-day human life. I use ‘ecological habitus’ herein with this value-neutral framing. However, like habitus, the concept and practice of ecological habitus are inseparable and it can be perceived at a singular point in time as a snapshot of an individual’s (or field’s) lifestyle. Such lifestyles (particularly the ecologically sustainable variants) are what Haluza-DeLay describes as ecological habitus.

Ecological habitus as a conceptual tool, Kasper claims, can facilitate “imagination of the relational processes” that are involved in the generation and practical enactment of ecological habitus (Kasper, 2009a, p.321). Consequently, she sets the challenge for researchers to deploy ecological habitus in this way to frame their research.

To better understand the conditions of existence that contribute to certain characteristics of habitus - in the long and short terms - is not only of academic value but is of increasingly practical significance (Kasper, 2009a, p.320).

Such research, as this quote demonstrates, could unveil the conditions that perpetuate unsustainable ecological habitus, and potentially, how to change these. As Kasper argues, this is a momentous contemporary task. In this thesis, I apply ecological habitus as a conceptual lens for this purpose, examining the conditions that prevent sustainable ecological habitus from growing in contemporary Western cities, and how to change this.

As well as the strengths of ecological habitus in portraying social conditions and macro-structures (e.g. cultural, political, and economic) that enable unsustainability to persist, ecological habitus also provides a way of conceptualising larger, global contemporary socio-ecological crises, and linking these broad-scales with people’s everyday lives. This is the focus of Gäbler’s (2015) proposition for ecological habitus, as a way of linking socio-ecological transformation to everyday practice. This is the final application of ecological habitus that I review.

2.5.5 Gäßler's ecological habitus, transformation, and everyday practice

Gäßler's (2015) conceptualisation of ecological habitus pertains to a broader field than Haluza-DeLay's environmental organisations and Karol and Gale's focus on pedagogues. He frames ecological habitus as the shared habitus of an assemblage of people who together comprise an 'ecological field'. These include people from environmental movements, politicians, scientists, and 'ordinary' people, whose common, but variously conducted and socially mediated, goal is to gain "ecological integrity" (Gäßler, 2015, p.81). He further argues that the agenda of the ecological field as a whole will only make progress within today's unsustainable society if new players are incorporated into the field and/or its existing players are adequately empowered. The concept of an 'ecological field', which is not a socially structured unit unto itself, is useful for conceptualising who the stakeholders, or 'players' are in the 'game' of creating ecological sustainability. Pragmatically speaking, it could furthermore help to define who is not involved, and subsequently identify potential ways to change this.

The other compelling facet of Gäßler's (2015) work is its attention to everyday practice. He describes how existing approaches focus on macro-structural policy change (e.g. multinational climate agreements), at the expense of practical, day-to-day ways of affecting change. Meanwhile, he argues, other approaches use greenwashing (e.g. 'green' capitalism) to influence everyday consumption practices, commodifying socio-ecological issues while failing to address the fundamentally unsustainable nature of capitalism itself (Gäßler, 2015). Changing existing unsustainable ecological habitus, he therefore argues, will require broad-scale redefinition of 'the good life' in everyday practice.

Gäßler consequently proposes that one challenge in creating socio-ecological change is to understand the socially embedded structures and corresponding day-to-day practices of resource use that prevent more sustainable socio-ecological relations from emerging, and seeking means of challenging and potentially transforming this doxa. Ecological habitus, he suggests, offers an apt means of framing and understanding the perpetuation of current (unsustainable) doxa by humanity in general, and formulating ways to begin a socio-ecological transformation at the broadest of scales, without losing sight of what 'ordinary' people do day-to-day. Applying ecological habitus to link broad paradigms (and their reproduction or change) with everyday socio-ecological practice is another concept taken up in this thesis (Chapter 6).

2.6 CONCLUSIONS

This chapter depicted Bourdieu's 'habitus', a pragmatically valuable theory, which provided him with a framework for conducting sociological and anthropological research at the time of its inception. However, as a relatively transposable (i.e. timeless and broadly applicable) theory, due in part to its continual reference to extant practice, habitus continues to offer value to a broad scope of research topics into the 21st century.

Socio-ecological research is one of the contemporary fields that has developed upon and benefitted from Bourdieu's work. An understanding of the social and individual embeddedness of ecologically salient dispositions, capitals, practices, and fields, and how these are passively or unquestioningly reproduced through routine or consciously/critically reflected upon and changed is of value to change-orientated sustainability research and practice. Thus, with some elaboration, ecological habitus can provide a robust and pragmatically applicable theory or practice for socio-ecological research. Habitus, reflexivity, and Bourdieuan theory have permeated much of my thinking throughout this research, and I have also elaborated upon and applied ecological habitus as a theoretical/analytical framework for my research, as reflected in parts of the chapter that follows.

Chapter 3

METHODOLOGY

3.1 INTRODUCTION

This chapter describes the methodology³⁵ and epistemology³⁵ of my research, while the enacted methods of interviewing and analysis are covered in the next two chapters, respectively. I begin by summarising my total research approach (methodology and methods) to provide an overview of all three chapters. This chapter then focuses on qualitative expert interviews, which were my primary data generation instrument. I justify their validity within environmental management and their suitability for my research, and define and discuss their characteristics. I then present their pros and cons and discuss my positionality within the interviews. Appendices 2 & 3 contain companion information for this chapter.

3.2 OVERVIEW OF RESEARCH APPROACH

This research is underpinned by an interventionist forecasting epistemology. This is critical within sustainable environmental management, a field focused on planning for, and intervening in socio-ecological relationships to improve human and environmental outcomes (Barrow, 2006). Such ‘futures research’ focuses on revealing, constructing, or evaluating potential futures, including possible and preferable options for “what can or could be” and “what ought to be” (Bell, 2004, p.73). Mixed methodologies are generally engaged to conceptualise such futures and these can be categorised into four contrasting but complementary approaches (Popper, 2008b): qualitative, ‘interactive’ approaches such as ethnographic research (e.g. Hargreaves, 2008); ‘creative’ approaches such as design fiction (e.g. Ilstedt & Wangel, 2014); quantitative ‘evidence’-focused approaches such as modelling (e.g. Hawken & Steyer, 2017; Meadows, et al., 1972); and ‘expertise’ based approaches, which were my focus.

35. Epistemology describes theories of knowledge and their validity, while methodology describes the theory that underpins methods. These definitions are included because discussion of epistemology and methodology are (in my experience) not standard parts of theses within environmental management, which sits within the fundamental sciences at Massey University.

3.2.1 Overview of backcasting and dissensus Delphi approaches

‘Backcasting’ (Robinson, 1988) and dissensus (Steinert, 2009; Varho & Huutoniemi, 2014) variants of the Delphi method (Dalkey, 1967; Helmer, 1967) are established sustainable environmental management approaches that focus on such collective expert insight (Barrow, 2006). Backcasting (Robinson, 1988) was developed as a sustainability problem-solving methodology for situations when conventional forecasts predict that the status quo (e.g. unsustainable ways of life) will lead to an undesirable global future, but cannot inform ways to change this (Robinson, 2003). While conventional forecasts use present day (or past) data to predict *probable* outcomes for the future, backcasting approaches begin with the construction of a normative vision for a *preferable* future, such as the realisation of sustainability. They then work backwards to identify what barriers exist to realizing this vision, and what strategic, pragmatic actions in the present could address these barriers and contribute to creating a preferable future (Dreborg, 1996).

Assembling a cross-section of expert thought is an appropriate heuristic methodology for generating such insight and foresight, particularly in terms of sustainable futures, which are inherently indeterminate and informed by vast quantities of complex data (Dreborg, 1996; Varho & Huutoniemi, 2014). Accordingly, a ‘dissensus Delphi’ approach, a qualitative adaptation of the traditional Delphi method, was employed, which capitalises on experts’ specialised knowledge, evidence-based rationality and experience-tested pragmatic insight to foresee alternative futures and solve problems in the present (Varho & Huutoniemi, 2014). While the traditional Delphi method seeks consensus on the “best” solution to a problem, or “most likely” outcome of a scenario, the dissensus Delphi approach that I follow involves assembling a diverse range of experts to construct multiple options for creating change in the present, towards a more sustainable future (Varho & Huutoniemi, 2014, p.153). Appendix 2 further reviews the goals and approaches of contemporary environmental management and sustainability research that this thesis responds to, and details forecasting, backcasting, and dissensus Delphi approaches and how I engage them.

3.2.2 Overview of expert interviews

To gather such expert insight, data was generated through 25 qualitative interviews (face-to-face in 23 instances, and once each by telephone and email, where face-to-face arrangements could not be made). Interviews generally lasted one hour and employed open-ended questions to prompt explorative discussion (Kvale, 1996). The step-by-step interview procedure is detailed in Chapter 4. In addition to the benefits of distilled expertise, interviewing experts qualitatively enables the generation of rich, contextualised, multidimensional and in-depth data, which is often lacking in quantitative alternatives (Mason, 2002), and provides for the nuanced co-construction of data that

is tailored to the research aim (Kvale, 1996). Meeting most experts face-to-face added such layers of value to the data generation process, for example enabling more informal/sociable conversation, and natural direction of the interview than the telephone and email interviews did (with visual cues and ability to pick up on intonation), and facilitating spontaneous sharing of resources and snowball recommendations. Importantly, my dedication to the research (evidenced especially by my long-distance travel) was commended by the experts and potentially enhanced their willingness to participate. Detailed pros and cons of my expert interviews are discussed later in this chapter.

The experts included 20 pre-selected North American experts and five who were identified through snowball sampling (Bogner, et al., 2009). Collecting a diversity of perspectives about how to create sustainability in Western cities was my priority. Thus, the research included experts from academic/research disciplines (e.g. sociology, psychology, and economics); federal government; the public sector; environmental communities and organisations; applied disciplines (e.g. planning, architecture, and design); activists; educators; and visionaries (full list on p.85). In addition to their specialised knowledge, selection criteria included interdisciplinary, solutions-focused, and future-orientated experts, in line with my research aim. North America was selected as a study ground because the concentration of experts there allowed a diversity of expertise to be included within the research constraints (time and finance), and because North American cities represent some of the highest per capita ecological footprints worldwide, placing experts in the region at the coalface of sustainability-transition research. Chapter 4 further details my selection of experts.

3.2.3 Overview of data analysis

I transcribed the interviews myself, amounting to a tome longer than this thesis. Within qualitative interview methodology, transcripts are seen as part of a “continuous unfolding” of meaning (Kvale, 1996, p.183), not objective or discrete units of data. This is because they are unequivocally human constructs, resulting from a combination of co-constructed dialogue, the transcriber’s interpretation of this, and directed filtering of the discussions and transcripts for relevance to the research objectives, all of which are necessary and desirable parts of the interview process (Kvale & Brinkmann, 2009; Tracy, 2013). A selection of quotes from my interview transcripts are included in this thesis, and these are attributed to each expert with their express written permission.

Coding and mapping of the data was an inductive approach drawing on ‘grounded theory’ (Glaser & Strauss, 1967), which is a mixed-methods, non-linear process, developed iteratively by the researcher as they go (Glaser & Strauss, 1967; Kvale, 1996). This was undertaken with constant, reflexive comparison between the data and the research aim (Suddaby, 2006; Tracy, 2013). This is

appropriate for theory-building and meaning-making research where the final outcome is undefined in the early stages, and contrasts with hypothesis/theory-testing research (Berg, 2009; Bogner, et al., 2009; Deming & Swaffield, 2011; Kvale & Brinkmann, 2009).

It is also critical for research in fields of rapid change, such as sustainability, where theory must evolve to keep pace with knowledge and practice (Flick, 2014). My initial coding of the transcripts was descriptive, identifying key words and concepts as they appeared in the data (Tracy, 2013), before developing categories and later themes to reflect these, with sensitised consideration of the data-context and research aim (Suddaby, 2006). Like transcription, my coding was manual to facilitate immersive comprehension and interpretation of the data (Knight & Ruddock, 2008), and recognition and construction of meaningful patterns within/from this (Kvale, 1996), which can be lost through computerised coding (Knight & Ruddock, 2008; Suddaby, 2006).

Codes were then visually mapped to contextualise them among broader categories, understand cross-category/interview links (Novak, 2010), and perceive the ‘bigger picture’ (Kvale, 1996). Such crossways analysis enables recognition of themes that are scattered amongst interviews (Meuser & Nagel, 2009), and counteracts loss of perspective that is a risk with deep data immersion (Johnston, 2006, p. 323, as cited in Knight & Ruddock, 2008). Data analysis is detailed in Chapter 5.

3.2.4 Overview of thematising with ecological habitus

Thematising analysis was then undertaken, employing and developing the emergent theory of ‘ecological habitus’ as an analytical and conceptual framework, after other false starts (see 5.5). Selection of this theory was made in a relatively grounded way, which (surprisingly to me at the time), is an unusual occurrence. Despite its explorative, and inductive aspirations, grounded research often falls back on researchers’ familiar disciplinary literature and theories (Glaser & Strauss, 1967); or the agenda and expectations of the researcher with reference to their research community (Christiansen, 2011), such as preference for ‘normal/acceptable’, publishable, or fundable topics.

For me, ecological habitus was not a familiar or comfortable option because of my intellectual unfamiliarity with anthropology and sociology (see Chapter 5). I reviewed countless theories from many fields of literature over the course of the research, and discussed many more in the interviews. However, in the later stages of my analysis it became clear that ecological habitus (drawing on Bourdieu’s theories) provided a very appropriate option. While other theories could undoubtedly frame the research, ecological habitus exceeded the thresholds required to legitimise its selection for this purpose, as follows:

1. The Bourdieuan origins of ecological habitus enable it to act as a conceptual tool for describing and understanding bio-psycho-social³⁶ phenomena and how they reflexively interact, including through individual (psychological/cognitive) socialised dispositions, physically embodied practices, social fields and structures (e.g. political, institutional, familial, cultural), the capitals (economic, social, symbolic, cultural, etc.) that result from and construct these things, and individual reflexivity (including of identity, self and social-awareness, etc.). This can inform understanding and conceptualisation of how and why people enact given socio-ecological relations, and extant ecological habitus literature has developed ecological habitus for this express purpose.
2. Ecological habitus can act as an umbrella conceptualisation, spanning many disciplines (e.g. psychology, education, economics, sociology, and anthropology), and bridging dichotomies such as social norms (e.g. hegemonic Western unsustainability) versus individual dispositions, stasis versus change, and humans versus nature. This enables it to cater for whole-systems conceptualisations as required of sustainability research. Its use as a research tool for linking broad-scale environmental issues with everyday practice has previously been proposed by Gäbler (2015).
3. Ecological habitus describes how social (and therefore socio-ecological) norms become embedded and reproduced over time and how they unintentionally and intentionally change, and can be changed on different structural levels, which is required for the normative/interventionist epistemology of my research, and its use to describe incidences of socio-ecological change has been evidenced elsewhere (see Chapter 2).
4. Mirroring Bourdieu's 'habitus' it can act as a methodological research tool for generating and answering research questions and/or assessing habitus and aspects of habitus. The use of ecological habitus for this purpose has been proposed by Kasper (2009a).

Building on these capacities, I re-interpreted ecological habitus into a novel, cyclic model for describing and assessing the socially embedded stasis of ecological habitus and/or how it changes (unintentionally or intentionally), focusing in this case on its relative sustainability and how to improve this (see Chapter 6). This involved elaborating upon existing ecological habitus theory by incorporating 'ecological reflexivity' (as a parallel of Bourdieu's 'reflexivity'; see Chapter 7) and 'natural capital' (see Chapter 9) to reinforce its utility as a socio-ecological methodological tool. The resultant framework facilitated my construction of coherent pathways towards sustainability in Western cities from the interview data (including aspirational visions, barriers to realisation, and practical actions to overcome these), which was the main aim of my research. These pathways are discussed in Part II of this thesis, and are framed by this newly developed ecological habitus framework.

36. See Pickel's (2005) discussion on habitus as a biopsychosocial process.

3.3 QUALITATIVE EXPERT INTERVIEWS

Having overviewed my complete method(ology), this section occupies the remainder of the chapter, focusing on the qualitative expert interviews that I deployed to generate my research data. First, I review qualitative interviewing and its place within environmental management. Then I focus specifically on expert interviews, and discuss their pros and cons relative to the purposes of my research and with reflexivity of my positionality.

3.3.1 Qualitative interviews as environmental management research tools

Qualitative interviewing entails another distinct and established methodological tradition, in addition to futurism approaches outlined above and in Appendix 2. Such interviews have a long, but disparate history as a research tool in psychology, philosophy, and sociology, however it is only in the past few decades that more cross-disciplinary literature addressing qualitative theory and methodology has been developed (Kvale, 1996; Witzel & Reiter, 2012). Qualitative interviews remain one of the most widely used research tools in the social sciences (Edwards & Holland, 2013), including extensive use in the research of built environments like cities (Knight & Ruddock, 2008).

Within environmental management research, qualitative interview approaches are a newer development. In my PhD institution and elsewhere, environmental management has a long-established place among the natural sciences. There, “hard” quantitative methods dominate, and “soft” qualitative methods have too often been uncritically labelled “immature” science (Kvale, 1996, pp.67-69). However, in recent decades, environmental management has become increasingly cognizant of the value and nuance that qualitative approaches bring to research, and multi-disciplinary approaches are now widely accepted (Barrow, 2006). Significantly, in best practice research, the rigid belief in ‘objectivity’ has been replaced with a more pragmatic and reflexive recognition of the influences of socio-economics, politics etc., in the environmental management field, and acceptance that researchers’ own viewpoints inform their research decisions and approaches (Randolph, 2004).

Because interviews have a well-developed methodological history and foundation in social sciences, my own interview methodology draws strongly on literature from this realm, particularly methodologies for expert and elite interviews. Kvale’s *InterViews* (1996), and Bogner, Littig, and Menz’s *Interviewing Experts* (2009) offered the methodological and epistemological foundations for my interviewing approach, as well as providing much needed detail and case study examples. I was also inspired from the outset by the work of Thompson (2000a, 2000b, 2000c, 2002) who conducted and reported upon a similar series of explorative qualitative expert interviews.

Thompson's research (for his own PhD) focused on landscape architecture professionals and sought to identify the broad values that underpin their field, and to create a framework for conceptualising this. Thompson's book (2000b), for example, situates each value (i.e. theme) with reference to topical literature and to his framework, which is the approach that I follow in Part II of this thesis.

The defining features of qualitative interviews are their open-ended and inductive approach, smaller sample size, and pursuit of in-depth responses, in comparison to quantitative alternatives. Quantitative interviewing (e.g. surveying) claims a more 'objective' approach, focusing on testing theories and hypotheses; measuring and refining variables; producing statistics; observing generalised patterns; and achieving replicability (Edwards & Holland, 2013). Qualitative interviews like mine have different advantages to these, especially the generation of rich, nuanced, contextualised, multidimensional and in-depth data, which is generally lacking in quantitative methods (Mason, 2002). Kvale (1996, p.2) describes qualitative interviews as a "construction site of knowledge", where data is generated, or "co-constructed" through the exchange of views between the participants (traditionally seen as 'interviewer' and 'interviewee'³⁷) on topics of mutual interest, rather than being extracted unilaterally by the researcher, in the controlled manner of quantitative methods.

This highlights a limitation of qualitative interviewing: it requires both skill and understanding from the researcher, demanding a degree of "craftsmanship" to elicit substantial and relevant responses and clear explanations from the interview participants (Kvale, 1996, p.145). This can be particularly problematic in expert interviews, where participants can be especially critical of the interview instrument (e.g. format, wording, focus) and the researcher themselves (Bogner & Menz, 2009). Mitigation strategies that I deployed against this effect are described further below, with regards to my positionality in the interviews.

Legitimacy and rigor of qualitative methods are also achieved in different ways to quantitative approaches. The scientific method, traditionally applied in environmental management, establishes legitimacy through standardisation, stemming from the canon of the controlled experiment (Barrow, 2006). Validity, reliability, and generalizability are typically achieved through the robust deployment of scientific methodological convention and usually without any methodological reflexivity (Mishler, 1986). In contrast, qualitative research methods establish how well-grounded and convincing their validity, reliability, and generalizability are through detailed and transparent disclosure of the methodological practices employed (Kvale, 1996; Mishler, 1986). I provide such a disclosure of my reflexive and adaptive interview design and method in the next chapter for this purpose.

37. In this thesis I apply the terms 'expert' and 'participant' rather than 'subject', 'respondent' or 'informant', in line with the notion of interview participants as co-generators of interview data. I apply 'interviewer' and 'interviewee' to denote researcher and experts (respectively) when this is a reflection of the literature.

3.3.2 Expert interviews: definition and characteristics

Despite Nader's (1972) call for researchers to move in from researching the 'fringes' of American culture and 'study up' (i.e. study those with relative power) within the mainstream, expert interviews remain a small, ill-defined, and marginalised part of the interview literature (Gläser & Laudel, 2009). Concordantly, researchers remain reluctant to study up (Ross, 2001), and detailed descriptions and analyses of expert interviews remain scarce. Literature on qualitative methods generally defines 'expert interviews' only by their participants; thus any qualitative interview between a researcher and an expert is seen as an 'expert interview' (Bogner, et al., 2009). It is therefore of consequence to define what constitutes an 'expert', and this is discussed further below.

Studying up can involve several unique methodological features, which are shared by expert and elite interviews alike (Nader, 1972), particularly the unusual interview power asymmetry, which may afford expert/elite participants direction over the interview, or result in fixed or reserved responses. I found literature on elite interviews to be more profuse than expert interviews (see differentiation below), despite researchers' apparent denigration of elite interviews due to their perceived difficulty (e.g. in gaining access; Ross, 2001).

Experts are defined in two very different ways within qualitative interview literature. This is infrequently acknowledged, and has only begun to be debated in earnest during the past few decades (primarily in German literature, and less so in English; Bogner, et al., 2009). The first definition of 'expert', which is pervasive, and often portrayed in the literature as the only definition, is "people who possess special knowledge ... which the interviewer is interested in" (Gläser & Laudel, 2009, p.117). This definition delineates expertise relative to the researcher's interests. Gläser and Laudel (2009, p.118) describe how this definition involves "interviewees as experts", where any given person could be considered as an 'expert', holding "special knowledge" (that is gained through lived experience), into which they may be able to offer the researcher insight. For example, for someone researching left-handedness, I might offer an expert opinion, having experienced being left-handed. Defined in this way, such research participants are not necessarily people who hold elevated positions within the social field (e.g. culturally, symbolically, or socially). For example, I am not viewed as 'an expert' in my field and elevated socially by my colleagues because of my left-handedness. Much of the general literature on qualitative interviewing assumes only this definition, proceeding to focus on how to empower these 'experts' (who, without recognition as experts in the field, might be marginalised) to share their 'expert' understandings of their lives with the researcher.

A contrasting definition, found less often in the literature, but applied in this thesis, is where experts are defined as people who possess advanced and specialised knowledge (Flick, 2014) or skill relative to others in their social fields, and are recognised in these fields for these expert

capacities. This is the notion of “experts as interviewees” (Gläser & Laudel, 2009, pp.117-118). In contrast to those discussed above, interview methods for this kind of expert tend to focus on the professional knowledge and conscious understanding of the expert, rather than their biographical understandings and reflections (Dexter, 1970).

This type of expert is well recognised in fields of future forecasting, having traditionally been tasked with constructing technical models and deliberating on likely futures. However, within the literature specific to interviewing methodology, this ‘expert as interviewee’ definition is less common, discussed mainly in relation to specific methods that are directed at experts, and more often, elites. The two are sometimes addressed together because both elites and experts hold relatively high degrees of capital in their fields, and can present similar enablements and limitations for the interviewing researcher. For example, restricted access to the interview candidates, and the possibility of a power imbalance that enables invited participants (who may be relatively more powerful than the researcher) to command the direction of the interview (e.g. away from the research topic). These enablements and limitations (i.e. pros and cons) are discussed further below.

Elites and experts differ, but the distinction between the two is not always made in the literature. Elites are people who hold a significant degree of power in, and influence over their field, often by holding and commanding social or economic capital, which may be won or lost over time (Dexter, 1970; Kvale & Brinkmann, 2009; Mikecz, 2012). Examples of elites include high-ranking political, business, religious, or media figures. Experts, in contrast, generally have more technocratic knowledge (cultural capital), which is accumulated and retained over time, but often hold less power than elites (Littig, 2013). In the context of city research, experts might include seasoned, trained professionals such as planners, engineers, and landscape architects, while the elites might include wealthy property developers, or political officials with relatively little specialised knowledge in the technicalities of city affairs. Pfadenhauer (2009) further distinguishes ‘experts’, in contrast to ‘specialists’. Specialists hold high levels of specific knowledge and problem-solving ability, whereas experts hold both specific knowledge of one or more specialities as well as more comprehensive knowledge across specialities within their field. This gives experts the ability to look across ways, analyse root causes of problems, and understand the principles required to generate strategies to solve them. This definition of experts describes the people I selected as experts for my research.

The interview methodologies that are associated with the different definitions of expert discussed above fall across a spectrum. At one end of the spectrum, the aim of the interview is to understand people’s lived reality, and at the other end, to critically-mine specialised knowledge. Between these two extremes is a “grey area”, upon which little research has been conducted (Gläser & Laudel, 2009, p.118). Within this grey area, an interview with an expert-in-the-field might extend

to include elements of their lived social reality as well. Revealing the “person ‘behind’ his[/her] role” in this way can afford context to the interview, acknowledging the expert’s personal and professional understandings and experiences in the “process of meaning-making in which [their] knowledge is always embedded” (Witzel & Reiter, 2012, p.33).

The expert interviews undertaken for this research are situated within this grey area, aiming to elicit experts’ specialised knowledge-in-the-field, without disregarding the significance of the ‘person behind the role’. To be clear, the purpose of my research was never to describe or analyse this ‘person behind the role’, although my results draw on the examples from the experts’ backgrounds where illustrative. The relevance of the person behind the role in this research was that it informed the experts’ whole-person responses. Acknowledging this personal-professional grey area as part of my methodology therefore enables transparent recognition of the different sources of expert heuristics, which inform their deliberations on sustainability issues, often in positive ways (Varho & Huutoniemi, 2014). In particular, experts’ subjective positions are shaped by their personed-engagement with various sustainability fields and agents. These inform their deliberations about sustainability problems and futures (e.g. lived expertise around ethics, empathy, and responsibility), adding another valuable layer to their deliberations in addition to the occupational or intellectual knowledges that they are generally recognised for (Varho & Huutoniemi, 2014). As discussed above, this lived-experience is a key reason for selecting experts for research that seeks to generate visions and solutions for a more sustainable future. Accordingly, employing qualitative methods enables recognition and incorporation of these more valuable facets of experts’ perspectives.

Finally, acknowledging the person behind the role aligns with the theoretical underpinning of this thesis in habitus, which recognises the pervasive influence of life-history on current habitus and the role of critical reflexivity in intentionally, iteratively, and responsively revising habitus in response to a changing field and one’s own goals and values. While I actively recognise the role that the experts’ ecological habitus played in generating insight for this research (discussed below), critically analysing their habitus is not the intention of this research. However, my evolving understandings of ecological habitus and indeed my interactions with the experts did influence my methodological conceptualisations and theory development as my research progressed. Therefore, in the spirit of transparency and comprehensive discussion (and from the perspective of a developing critically-reflexive scholar previously disciplined in ‘objective’ methodologies) I offer a brief post- hoc review of some of my experiences practicing reflexive research in Appendix 3.

3.3.3 Pros and cons of expert interviews

Qualitative expert interviews were an appropriate choice of data generation for my research aim. Nevertheless, these entailed pros (i.e. enabling factors), which are discussed below, and cons (i.e. limiting factors), discussed later in this section. Higher-order pros and cons of backcasting and Delphi approaches (e.g. their future-orientated epistemology, normative and speculative characteristics, and comparison to traditional forecasting and deductive experimental approaches) are covered in Appendix 2, while pros and cons of my interview procedures are discussed in Chapter 4 and my analysis in Chapter 5.

a) Pros of expert interviews

Qualitative interviewing enables generation of rich, contextualised, multidimensional, and in-depth data that is often lacking in quantitative alternatives (Edwards & Holland, 2013; Mason, 2002), and is particularly valuable to exploratory, future-orientated research (Bogner, et al., 2009). My interviews provided a forum with informed, articulate experts from different disciplinary, occupational, and personal backgrounds for exploring, generating, and synthesising distilled, up-to-date, specialised knowledge and foresight that was targeted to my research aim (Edwards & Holland, 2013). I discuss these benefits in turn below.

- Generation of distilled, specialised, and articulate insight and foresight

The experts I interviewed held a wealth of specialised knowledge and practical experience. Collectively this represented centuries of time exploring socio-ecological, city, sustainability, and change-making issues. Accordingly, a strength of my interviews was the distillation of a “vast mass” of expert insight (Adler & Ziglio, 1996, p.6; see also Varho & Huutoniemi, 2014). Moreover, by selecting experts with solution-focused, future-orientated, and interdisciplinary approaches, as determined by my literature review (detailed in 4.2.1 - 4.2.2), the interviews generated nuanced data (especially understandings and foresight) tailored to my research aim (Kvale, 1996).

Another major benefit of interviewing experts (compared to lay-people) is that their professional expertise and practices enable them to “manage information quickly” (without need for prolonged reflective consideration), using embodied heuristics to problem-solve, deal efficiently with uncertainty, and make immediate connections between ideas (Varho & Huutoniemi, 2014, p.145). This enables fluent and rapid responses within interviews, which are also articulate, considered, and critically-reflexive (Bogner & Menz, 2009; Ross, 2001).

- Access to “grey areas” of knowledge

Experts are “observers of information” (Varho & Huutoniemi, 2014, p.145) whose embodied heuristics (i.e. habitus) stems from a combination of “evidence-based”, “rational” knowledge

(Varho & Huutoniemi, 2014, p.145) and “factual evidence” (Dalkey, 1968, p.4), as well as tacit knowledge (i.e. not yet confirmed to be certain, Dalkey, 1968), enabling provision of “best estimates of an uncertain issue, including future events” (Varho & Huutoniemi, 2014, p.144). This gives experts access to a “grey area”³⁸ of knowledge, that is described variously as wisdom, insight, informed judgement, experience (Dalkey, 1968), gut-feeling, or intuition (Varho & Huutoniemi, 2014) that results from cumulative past experience. Such insight is filtered through experts’ specialised critical-reflexivity in ongoing ways. In my research, experts’ ecological habitus (i.e. collective experiences and knowledge that informs their socio-ecologically salient insights) made the interviews particularly data-rich.

Qualitative, speculative, and subjective data such as this is sought-after in futures research and within backcasting and dissensus Delphi approaches. Firstly, because it can contribute to imagining preferable alternative futures and planning how to practically create these when conventional forecasts predict undesirable futures under the status quo (Robinson, 1988). Creating such engaging visions of preferable futures is widely called for but under-delivered in sustainability (Dreborg, 1996; Ilstedt & Wangel, 2014; Meadows, et al., 2004; Robinson, 1988) and cities research, where ‘imagineering’ sustainable futures (Ratcliffe, et al., 2006) and diversifying available solutions (Williams, 2010) are both desirable.

Secondly, data from this “grey area” can inform future planning and decision making, and direct change when conventional forecasts, necessarily based on “factual knowledge” alone, have thus far failed to provide comprehensive solutions³⁹ (Varho & Huutoniemi, 2014, p.148). This is especially relevant for intractable ‘wicked’⁴⁰ problems such as sustainability, which are complex, evolving, difficult to measure or predict, involve market externalities, and occur across long time horizons (Robinson, 2003); where solutions must involve breaking dominant trends and engaging a diversity of agents (Dreborg, 1996); and where ongoing critically reflexive evolution of knowledge and practiced approaches is necessary (Robinson, 2003). Further discussion of the normative and speculative characteristics of futures research is provided in Appendix 2.

- Several heads provide greater interdisciplinarity than one

Plurality and diversity in my expert panel enabled a diversity of reasoning and heuristics (derived from experts’ favoured theories, methodologies, approaches, and experiences) to be applied to my research question, generating a corresponding diversity of problem-framings and potential solutions (Varho & Huutoniemi, 2014) and allowing more varied and balanced research outcomes (Dalkey, 1968). Thus, the purposeful selection of experts (details in 4.2.3) with diverse specialties

38. This is discussed in different literature to the “grey area” of expert interviews described above, but has a similar meaning, sitting at the interface of specialised/professional/personal understandings.

39. As evidenced by humanity’s excessive global ecological footprint.

40. See Rittel (1973).

and experiences relevant to my aim meant that the interviews generated responses across a diversity of specialist lenses (Bogner & Menz, 2009; Ross, 2001). Such diversity can counter potentially unreflexive biases that experts can hold, and provide for more broad-spectrum analyses (Varho & Huutoniemi, 2014). The meta-view of expert insight that this diversity generated enabled me to recognise important ideas *across* interviews (i.e. discussed by several interviewees), which individual experts did not necessarily focus primarily upon, and might therefore have seemed relatively inconsequential. Additionally, by interviewing the experts separately (and to a lesser degree, limiting discussions of what experts said to one another⁴¹), the effects of dominant individuals, group pressure for conformity, and other social dynamics that can skew responses in a group situation were avoided (Dalkey, 1968), further facilitating a diversity of responses (Bell, 2004).

- Generation of an interdisciplinary overview

The combination of specialty, diversity, and ecological-habitus-informed heuristics across my interviews meant that a relatively holistic overview of sustainability in cities was generated in the final data set. Of particular benefit were ideas that had ‘fallen through the cracks’ of my own conceptualisations. A recognised strength of collective expert-insight methodologies, especially when applied to future-orientated research, is this stimulation, discovery, and organisation of ideas (Varho & Huutoniemi, 2014). The interviews highlighted ideas that I had missed due to my own conceptual/disciplinary limitations and biases, siloisation of the literature, the limitations of publishing forums, etc., as well as ideas that I had not encountered when reading the experts’ published works. For example I was unfamiliar with the specific terms ‘silos’ and ‘ecological democracy’ until the interviews (although not unfamiliar with related concepts), and was somewhat surprised that almost all experts from across disciplines foregrounded tree-planting as a priority intervention (i.e. I might assume such a response from climate specialists or landscape architects, but less so from behaviour experts). Furthermore, although many of the ideas I cover herein are well traversed, these are dispersed widely and there is distinct siloing of what is published and cross-referenced where. This is evident, for example, in the idea of ‘sustainable ecological habitus’ proposed by Karol & Gale (2004), which is not mentioned in any ‘ecological habitus’ literature that I have reviewed (the majority of which has been published since 2004), despite their common Bourdieuan origin and conceptual similarity.

Furthermore, the experts’ willingness to present ideas surrounding, across, and beyond their specialties (i.e. across silos), based on informed judgements, evidence, and experiences of interdisciplinarity, helped me to recognise similar interdisciplinary connections in my own

41. Some experts asked what others had discussed/thought, but I endeavoured to save these responses until the given expert had expressed their own opinion.

analysis and research – something that is sought-after, but often not fulfilled, in sustainability literature (Schoolman, et al., 2012; see Chapter 8).

- Access to informal, unpublished, and emerging ideas

The interviews provided access to information that would be unobtainable through review of published literature alone. This included informally pursued ideas and the experts' most recent interests, knowledge, and practices, some of which may never be formally recorded or published (Gillham, 2005), and which my expert-orientated method was especially beneficial for gathering (Dalkey, 1968). At times, experts' responses included informal knowledge that they did not necessarily see as being relevant to their professional interests, or which they did not see as having a forum for publication, but was nevertheless considered relevant to city sustainability. For example, many experts had not published work about 'silos', despite observing their effects and considering them important. Informal observations of this kind are another form of knowledge that the experts' specialised, practical, and institutional experience provided.

Experts also referred to works in the process of being thought-out or published at the time (e.g. Kasper's newest insights about ecological habitus, Costanza's emerging ideas around eco-gaming, and Schor's forthcoming research on eco-habitus and consumption). Perhaps the most significant example of ideas from the interviews remaining unpublished was my interview with Stephen Kellert, who sadly passed away after the interviews. He offered me incredible insight and candour, and while much of our discussion related to his published ideas, this was targeted to respond specifically to the concerns of my research (i.e. his ideas were expertly distilled and focused), and went beyond the extent of his published volumes as well. Incidentally, Kellert also employed expert interviews during his own PhD, decades prior, and offered me further insight still about the methodology of these.

- Benefits of interviewing face-to-face

There were additional benefits to interviewing face-to-face. This allowed communication via body language and other audio-visual cues and enabled experts to present printed /material to supplement their responses (Gillham, 2005). For example, I was often presented spontaneously with books, news stories, diagrams, sketches, graphs, presentations, webpages, photographs, online tools, models, etc. Unlike the email and telephone interviews, these additional resources were not necessarily experts' own published (and readily available) works.

I was also invited to explore the experts' institutions, campuses, local city features, and projects on-the-ground and in one case, to participate in a fundraising event (Ottawa's 'Harvest Noir', a Bioregional North America event). These provided me with additional layers of understanding, which helped me holistically recognise and reflect upon the various contexts, values, and logics

that informed the experts' responses, and the field of sustainability in general in different places. Significantly, such experiences enhanced my critical ecological reflexivity, immersing me in novel physical contexts and concepts, imbuing me with new capitals (e.g. cultural, intellectual, and moral) and new fields of action.

b) Cons of expert interview

There were also limitations to my approach. My limited experience with research interviews, and relative lack of knowledge in the experts' specific disciplines and social fields (e.g. local politics, demographics, city policy etc.) were limiting factors, which I attempted to mitigate against in various ways. I also encountered limitations to accessing experts, direct challenges to interview questions, and specific challenges with the telephone and email interviews. I discuss these in turn below. Higher order limitations (e.g. the speculative nature of futures research, and subjective/normative characteristics of backcasting and dissensus Delphi) are discussed in Appendix 2.

- Limitations to my own knowledge and experience

To inform my interview practice at the outset I reviewed relevant literature, sought examples, and conducted pilot interviews. However, I also continued to refine my approach throughout the research process. There were several specific reasons why this was necessary. These included familiarising myself with words that were difficult for the experts to understand in my accent and articulating these more clearly; changing phrasing/vocabulary that caused confusion (e.g. my use of 'tip' to describe a piece of advice was misinterpreted more than once as a strange, decontextualised reference to a financial gratuity); and modifying some of the wording of the interview questions, as detailed in the next chapter. Ultimately, and indispensably, the experience I amassed through the expert interviews fortified the confidence I held in my practice as a researcher, and enhanced the ease and animation of my interview practice as I progressed.

My intellectual understandings also evolved through the interview process and analysis, with the significance of different interview themes becoming increasingly apparent. This advantaged my approach in the later interviews to a degree, enabling me to comprehend the experts' responses through cumulative understandings (e.g. of nomenclature and local/national topical/ecological issues) gained through preceding interviews. However, I kept the main interview questions fixed so that each interview was roughly equivalent. Despite my efforts, the course of the interviews remained partially subject to the particular topics that each expert chose to focus upon (discussed below).

Although I had undertaken a significant literature review before beginning, my knowledge of the experts' specific disciplines and research interests was, compared to their expertise, relatively limited. This was mitigated to degrees by my methodology. Asking high order questions prevented me having to frame the discussion with reference to their particular speciality, enabling each expert

to respond from their position of expertise. I was also inherently positioned, and actively positioned myself if necessary, as ‘naïve but interested’ in comparison to the experts’ disciplinary backgrounds, magnitudes of experience, and familiarity with North American case studies. This provoked explanation of ideas, concepts, and candour in most cases. I did, however, bring my own degree of national and disciplinary experience to the interviews. This enabled me to reciprocally offer a degree of novel information (example given below), which further engendered generous explanations and discourse.

- Gaining access to experts

My initial strategy for gaining access involved furnishing each expert with a list of well-respected potential participants, themselves included, ensuring recognition of their status (Ross, 2001; Undheim, 2003). Their acceptance was further facilitated by giving advanced notice of my proposed timeframes; allowing them scope to set the specific date, time, and location of the interview; and asking for only one hour of their time (details in Chapter 4). The purpose of this was to enable them to schedule the interview within their existing agenda and provide an ease of participating within their normal environment and at their discretion.

Additional priming, such as preliminary meetings through Skype may have benefited both my understanding of the experts’ specialised fields and provided me with practice for later, face-to-face interviews. More experience with the peculiarities of each expert, and with the various North American particularities might have eased the face-to-face interview process for me, countering the uncertainty I faced in this foreign setting. It might also have provided me with an early introduction to the varied disciplinary and ideological nomenclatures and frames of thinking. This would have allowed me more time for interim reflection, which I ultimately found allowed my understandings to develop and perhaps would have enhanced my ability to assimilate these eccentricities and tailor my questioning approach accordingly. However, my experiences with digital interviews (detailed below) suggest that such a strategy may equally have caused diminishing returns in response rate, because of the inconvenience of multiple exchanges. Requesting feedback on preliminary ideas before the face-to-face interviews may also have provided too much opportunity for the experts to sway the direction of the study towards their own interests or the perspective of their field (Obelené, 2009). As it stood, some experts suggested alternative directions that my research could (or should) take. For example, one expert suggested that,

Maybe what your piece is beginning to get at, or maybe what your piece should get at even more is, if one thought about environment as entropic [rather than sustainable]. That there is this life and death ... Because that’s the place that we normally can’t deal with.⁴²

42. This quote and the one on the following page are included as part of a post-hoc reflection on my methodology in line with the transparency that this chapter aims to provide, and my ongoing reflexive self-assessment; it is not intended as a final interview result.

This was nevertheless valuable in helping me understand the experts' unique perspectives on my research topic.

Gaining access to experts for interviews is another recognised challenge. Agreement to participate relies upon presenting attractive, intriguing, or ambitious research that resonates with them, creating a sense of interest and aspiration to collaborate (Gillham, 2005; Obelené, 2009; Ross, 2001). As detailed below, this was achieved with a respectable rate of success, perhaps because I selected experts whose interests aligned with my research. The success was also demonstrated in part within the interviews, when experts commented favourably on the ambition of my approach and the unusually exploratory scope of my research, as opposed to other doctoral research on very narrow topics and within the confines of specific disciplinary boundaries⁴³. For example, one expert commented:

You are taking a very holistic perspective, which is difficult. Almost nobody does that... People are, like me, we're all working in our little boxes [disciplines]. Almost nobody takes this holistic perspective, because it's very difficult to integrate across the different areas. We speak different languages; we use different terms ... and different approaches... Trying to merge them all together in one ... sounds really difficult - really interesting. I'm anxious to see what the themes are that emerge.

Gillham (2005) suggests that keeping up-to-date with new developments is another motivation for experts participating in such research. I found this to be true, with several experts inquiring about my previous interviews. In this way, my unusually-broad bridging of disciplines may also have encouraged participation, particularly since the experts were selected for and sympathetic to interdisciplinary approaches⁴⁴ among other criteria (detailed in 4.2.3).

This assortment of access strategies secured 20 interviews from the 32 invited; a respectable response rate of 62.5% (e.g. compared to Ross, 2001 whose interview invitation response rate by women politicians [i.e. a similar incidence of studying up] was a "perfectly respectable" 45-47%, p. 159). Five further interviews resulted from snowball sampling⁴⁵, giving me a total of 25. What constitutes a sufficient sample for qualitative interviews, especially in-depth, and/or exploratory variants depends on methodological and epistemological approaches. Although there is no 'standard' sample size for qualitative interviewing, 25 sits within the range delineated by Baker and Edwards' (2012) review of 19 studies, suggesting it is appropriate relative to others' approaches, and is at the upper end of the scale for in-depth and exploratory interviews, as defined by authorities in this field (Brinkmann & Kvale, 2015). Moreover, the diversity of disciplines offered a broad array of

43. For example, one expert commented favourably, but noted that, "it's very hard to get a PhD without knowing more about less."

44. Despite their interest in interdisciplinary approaches, some experts did not feel able to practice this as freely as they might have liked, due to institutional structures that they described as being restrictive (see Chapter 8).

45. Snowball sampling involves gaining recommendations of additional research participants from existing participants (see 4.2.3).

responses to my aim, and further interviews would have been beyond my resource limitations in terms of time and funding.

Of those who were invited but not interviewed, two were forced to cancel due to Hurricane Sandy shutting down Manhattan Island during the scheduled interview times, and the significant disruption negated rescheduling. A further two were interested, but unavailable for interviews within the constraints of my field research itinerary. The remaining eight experts did not respond to any correspondence. This may reflect their protected positions as experts including filtering of correspondence (e.g. contact with several experts who were interviewed was strictly managed by their agents or assistants), or could be due to my misdirecting correspondence based on email addresses and telephone numbers sourced online. Upon reflection, asking the interviewed experts for personal referrals to those on my short-list whom I had not received a response from may have offered a way to overcome this at times, as some experts knew one another.

- Challenges in the interviews

Another difficulty was in garnering meaningful responses during some parts of some interviews. Generally, I believe that the experts were candid and obliging in their responses; however, opposition to interview agendas is one characteristic particular to expert and elite interviews, where the researcher can be relatively less powerful than the participants (Edwards & Holland, 2013; Gillham, 2005; Mishler, 1986; Morton-Williams, 1993; Undheim, 2003). Some of my expert interviewees expressed explicit opposition to, or (perceivably) curious uncertainty about, some of my interview questions, an issue that was compounded by the interdisciplinary nature of the research. Several critically analysed the wording and tacit meanings within my interview questions, for example commenting on the capricious meaning of the word ‘nature’ which was included in one of the interview questions⁴⁶, rather than responding to the question. This may have been a display of superior power and understanding (Abels & Behrens, 2009), but more likely stemmed from their previous experience in and knowledge of interdisciplinary discussion, where it is prudent to establish shared meanings from the outset. They may equally have asked out of curiosity.

These explicit challenges to my approach were confronting and intimidating at the time, but heightened my perception of the diverse tacit meanings and understandings embedded in the interview discussions. They did not change my interview approach outwardly, but armed with this heightened awareness of ambiguity and potential contention around language and meanings, I became increasingly able to recognise and situate the particular direction and focus of different experts’ responses. This was useful to me when attempting to perceive how experts’ responses aligned with or differed from my own and one another’s understandings, both in the interviews and later during my analysis.

46. See Table 5 (p.86) for list of interview questions.

- Telephone and email interviews

Other difficulties arose with the telephone and email interviews, which gave poorer quality responses, were significantly shorter, and appeared more reserved and self-referential. For example, I was directed to books, articles, or websites that the experts' had published, or referred back to responses to previous questions within the interview. One specific risk of interviewing experts is that they may revert to formulated responses (Gillham, 2005) or be unwilling to reveal information (Abels & Behrens, 2009). These risks require skill on behalf of the researcher to overcome, and the responses that I received in the telephone/email interviews may be reflections of my inexperience, although I did not encounter this in the face-to-face interviews. The absence of visual cues, body language, voice intonation and other personable or social aspects of face-to-face interviews may equally have contributed to this discrepancy (Bogner, et al., 2009). Moreover, it is possible that the telephone and email interview participants were less inclined towards being interviewed overall, hence their reluctance to meet in person.

c) **Pros and cons of my positionality within the interviews**

Face-to-face interviews, as with any interview type, are affected by the researcher's positionality vis-à-vis other participants, and any data generated is a function of the dialogic relationship between them (Bogner & Menz, 2009). Acknowledging the dialogics of power and emotion within interviews can enhance responses and improve emergent understandings (Edwards & Holland, 2013). Therefore, it was salient to define my positionality, which applies equally to other elements of the research, including transcription, interpretation, coding, and thematising of the data. Completing these processes myself bore the advantage of relative positional consistency (Flick, 2014).

Although my academic background distinguishes me to some degree, my positionality had some elements of the "interviewer as lay-person" typology defined by Bogner and Menz (2009, pp.68-69). This is a common approach in interpretive and theory generating⁴⁷ interviews, involving a committed but relatively naïve researcher of lower institutional status, or from a different field of expertise than the participants. It is a non-combative and non-competitive position to hold, and corresponds to my subordinate status as a postgraduate student, who was younger, less experienced, and from a different discipline than the experts. There is an inherent risk in expert interviews that a naïve researcher will be dismissed as ill prepared or unworthy (Morton-Williams, 1993; Pfadenhauer, 2009). However, this position may equally encourage candour and critically reflective responses by disbanding the competition, scepticism, or defensiveness that researchers of equal or superior status can engender (Pfadenhauer, 2009). Paraphrasing Bogner and Menz (2009), naïve yet pertinent questions stand a good chance of garnering the most interesting and productive answers, especially within a research framework that seeks to generate theory. The 'interviewer as lay-person'

47. "Theory generating" expert interviews progress beyond the explicit specialised knowledge that is sought in "systematising" expert interviews, thereby including tacit-interpretive and procedural elements of expert knowledge (i.e. the "grey areas" discussed above) (Bogner and Menz 2005, as cited in Littig, 2009, p.101).

position can furthermore engender trust and good-natured paternalism on behalf of the expert (Abels & Behrens, 2009; Bogner & Menz, 2009), and this corresponds to the reception I typically received.

The non-threatening position I held as a younger female studying (relatively powerful) experts may have facilitated this response (Edwards & Holland, 2013). The gender of interview participants can play an important role when interviewing experts, and female researchers, in particular, may face both prejudice and advantages. Of my expert participants, 12 were women, and 13 were men. Ross proposes that the “jockeying for the upper hand” frequently evidenced in interviewing elites/experts is a function of men interviewing men, as she found little evidence of it when female researchers interviewed female elites/experts (2001, p.160). Furthermore, Abels and Behrens (1998, as cited in Meuser & Nagel, 2009, p.35) describe how male experts offered more frank and detailed responses to female researchers, to “enlighten” them, and that this gender bias might be exploited further by employing “naïve and humble” questions. I think it likely that my interviews were shaped to a degree by such gendered interactions, perhaps inciting more explanation and less opposition. My relative youthfulness probably also contributed to this effect.

Additionally, as a foreigner, I may have been perceived as exotic and non-threatening (Ross, 2001). This was one of the benefits of conducting my research in North America rather than in New Zealand, where I could be perceived as an upcoming competitor in the field. I found that when I offered the experts something novel from my education, knowledge, or experience in New Zealand, interview participants would become more animated and engaged. For example, several spoke of a fictional scenario whereby a city could be redesigned from scratch to become more socio-ecologically enriching, beginning with an existing population base, and working from the ground up. They were therefore fascinated and surprised to hear about the Christchurch City earthquakes⁴⁸ and the large-scale, often innovative reconstruction processes that were underway at the time as a result.

I capitalised on my positionality in several further ways. The first was to demonstrate commitment to the research (Undheim, 2003), which I achieved by travelling great distances to interview each expert within their own domain. Also, allowing experts to choose the time and place of the interview, and asking for only one hour added to their convenience (Mikecz, 2012). Finally, employing an open-ended interview format allowed them to demonstrate their particular specialty, interdisciplinary expertise, and personal experiences (Kvale, 1996; Morton-Williams, 1993).

I also explicitly recognised the experts’ positions and status. When first engaging with the experts, I acknowledged their prestige by listing them among other highly esteemed individuals. Ensuring an understanding of elite or expert participants’ backgrounds can enhance respect (Kvale & Brinkmann,

48. In 2010 - 2011, a series of severe earthquakes struck New Zealand’s South Island city of Christchurch (population ~376,000 in 2010). The most serious of these levelled areas of the central business district, surrounding suburbs, and rural settlements, tragically killing 185 people and injuring thousands. Rebuilding the city has included the formation of new government departments, re-planning of the city’s land use to mitigate against quake risks (to residents, buildings, and infrastructure), and redesigning and strengthening buildings. This ‘rebuild’ is ongoing.

2009). As well as familiarising myself with each expert's profile before beginning fieldwork, I used biographical questions at the beginning of each interview to encourage such personalisation. To further this systematic recognition, I also identify the experts' quotes within my research results in this thesis. Anonymity in expert interviews sometimes enhances candour, when experts are concerned about the publication of their responses (Gillham, 2005), for example in politics. In other circumstances, however, personal and institutional identification can sanction mutual respect (Mishler, 1986), and this appeared to be the case for the experts I interviewed, the majority of whom were from academic backgrounds, where publication and recognition are important.

Another strategy for building rapport with experts is to present questions and concepts that resonate with them (Ross, 2001). This was ensured in my research by selecting individuals whose research, publications, teaching profile, or vocation significantly aligned with my own aim. I was open in the interviews about my research aim, and my personal and evolving positions on the issues that we discussed. Individualities within qualitative interview dialogics are inescapable, as any human researcher brings their own understandings, values, emotions and discourses to the process (Edwards & Holland, 2013). Thus, in contrast to quantitative (e.g. survey) methods, neutrality and objectivity within interviews and subsequent analysis and reporting are not achievable or desirable (Bogner & Menz, 2009). Instead, a transparent and critically reflective approach is endorsed for all qualitative research and this is advantageous to expert interviews. Openly explaining one's position is preferable to being judged upon the expert's (potentially inaccurate) perception of the researcher's "competence, professional background, normative orientations and attitudes, and possible influence within the field" (Bogner & Menz, 2009, p.57).

Moreover, showing personal and professional commitment to a particular viewpoint, emerging understandings of different viewpoints, or contestation of these can encourage experts to expound on topics of relevance to the research. It can reveal differences between the interview participants' understandings or orientations, which can be fruitfully discussed and perhaps even resolved through the interview process. Similar to the experiences described by Ross (2001), some experts were interested to explore my thoughts about the research topic, and how I might practically use the interview data in the future. This dynamic also facilitates reflexivity, highlighting and promoting critical consideration of the changing understandings of the researcher within the interview dialogic and throughout the entire research journey (Witzel & Reiter, 2012). Consciously practicing such reflexivity within the interviews was a result of my understandings of qualitative methodology laid out above, and enabled me to participate more fully in the co-construction of meaning and to be open to understanding the experts' many alternative perspectives. Finally, being candid helped to build trust and rapport with the experts, which is critical to constructive interviewing. See Appendix 3 for further reflections on my reflexivity throughout this research.

3.4 CONCLUSIONS

The role of environmental management and sustainability research is to conceptualise the various factors implicated in humanity's effects on the environment, and to find strategic ways to create improvement in these. This chapter outlined the place of constructive, future-orientated epistemologies such as backcasting and dissensus Delphi approaches within such research. Qualitative interviews were the specific methodology that I engaged to generate my data, enabling me to gather distilled, judicious insight (and foresight) from the front line of sustainable city thought and practice, and with targeted relevance to my aim. Such insight would be unavailable elsewhere (i.e. as the accumulation of many lifetimes of disparate knowledge), and would be unparalleled using alternative research approaches. The quantity and rich quality of data that was generated through the interviews was testament to the success of this approach.

Experiencing the pros and cons of expert interviews were exercises in interdisciplinary learning for me. Aside from the data itself, the major benefit of the interviews was the quality of practice-informed insight and specialised disciplinary variety offered to me by the different experts. This created untold development in my own understanding (e.g. of disciplinary terminologies, local and international issues, approaches to problem-solving, etc.) and the scope of my knowledge. I also experienced several of the limitations to such interviews, including difficulty accessing some experts, although I found my overall approach to gaining access, including through snowball sampling, to be relatively successful. Some experts also critically challenged some of my questions and wording. This, in turn, was valuable to my evolving and reflexive understandings of interdisciplinary research in this field. The email and telephone interviews were also challenging and less fruitful than the face-to-face interviews. Moreover, with only one telephone and one email interview, I was not able to refine my approach and try again. However, these validated the benefits of conducting most interviews in person.

The interviews, as qualitative and exploratory data generating instruments (and part of an overall inductive, theory-building approach) were also very different to the scientific, hypothesis-testing methods I was accustomed to in my previous experience in the fundamental sciences. This transition necessitated reflexivity around my positionality as a researcher and as a disciplinarily situated (and to degrees, siloed) individual, which was not comfortable (conceptually, emotionally, etc.), but was an enriching part of my research process. The data immersion that I later undertook during analysis (detailed in Chapter 5) similarly necessitated critical self-reflexivity. Ultimately this enabled me to better contextualise, understand, and frame the interview data. It also offered me a great deal of insight personally and has transformed my research outlook. While expecting to learn 'knowledge/facts' from within the specialised realms of the experts, I was less prepared (upon embarking) for the wide reaching wisdom that they would come to share with me or the reflexive capacities that their diverse perspectives would lead me to develop.

Finally, interviews that seek to engage with the ‘grey area’ where experts’ professional and personal understandings and insight meet are relatively rare, and detailed accounts of these are even harder to come by (e.g. Ross, 2001, is an exception, providing insightful notes on her experience). Obviously I drew a robust methodological foundation from literature on interviewing theory (Bogner, et al., 2009; Brinkmann & Kvale, 2015; Gray, 2014; Kvale, 1996; Littig, 2013; Tracy, 2013), but as described herein, undertaking interviews requires improvisation and creativity on behalf of the researcher, making them a learning experience and adaptive practice nonetheless. In the next chapter, I cover the step-by-step practicalities of the interview process.

Chapter 4

INTERVIEW METHOD

4.1 INTRODUCTION

This chapter describes how my interviews unfolded. It also justifies the adaptive method that I undertook and is annotated with methodological notes (where additional to Chapter 3). I provide details of my practice and reflexive transparency that is beyond the scope of journal articles and which I have found is overlooked and/or assumed in many other reports of research that engages such interviews. This chapter is generally chronological, beginning with the method of interview planning and design, while the second half of the chapter details the interview procedure.

4.2 EXPERT INTERVIEW PLANNING AND DESIGN

This section discusses the formulation of the interview design. It includes details of the literature review, conceptual mapping, selection of experts and inviting them to participate, design of the interview guide, pilot interviews, and ethical approval.

4.2.1 Scope of literature review

I began this research with an exploratory literature review, which later informed my selection of experts to interview. This step responds to Objective 1, to review literature from across varying disciplines related to socio-ecological problems in contemporary Western cities and any pragmatic solutions that have been proposed, in order to identify leading experts to interview.

I read widely from academic sources (books, journals, and theses), and pursued those relevant to the research aim. Literature was drawn from environmental management as well as associated disciplines such as city-planning and policy, environmental engineering, landscape architecture, and city design (Dorney & Dorney, 2012). Other disciplines were also included, such as psychology, sociology, anthropology, education, and philosophy. This was one of the times when the academic profile of my own habitus shaped the research. My assessment of what literature to include was instrumental to the research as there was no existing comprehensive synthesis or framework of the topics and disciplines that required consideration to meet the research aim.

Literature was drawn from Scopus, Google Scholar, Web of Knowledge, and ProQuest article databases, as well as the Massey University Library and affiliated BONUS+ catalogues. I used combinations of the search terms shown in Table 2, and selected material to review further, wherever titles and abstracts appeared pertinent to my aim. The search term list was developed during the literature review as I became more familiar with the schools of thought and terminologies in different disciplines. References cited in pertinent sources provided further literature to review.

Table 2: List of search terms used in primary literature review. *Indicates use of wildcard⁴⁹

Attitude*	Conservation*	Framework*	Integrat*	Perceiv*	Socioecolog*
Biodivers*	Design*	Futur*	Interdisciplin*	Percept*	Stewardship
Bourdieu	Disciplin*	Green*	Landscape*	Plan*	Sustainab*
Cities	Ecolog*	Habitat*	Lifestyle*	Polic*	System*
City	Educat*	Habitus	Management	Psycholog*	Urban*
Communit*	Environment*	Holistic	Multidisciplin*	Restoration*	Value*
Connect*	Fragment*	Imagin*	Natur*	Societ*	Vision*

The topical nature of this research meant that there was a constant stream of new information emerging, both academic and generic, and outside research hours I followed relevant news stories, including the Christchurch earthquakes and rebuild (see footnote 48, p.72) and watched pertinent documentaries, for example “*Jane Jacobs: Urban Wisdom*” (Jacobs & Alexander, 2006), and “*Radiant City*” (Burns & Brown, 2007). This supplementary exploration was useful in familiarising myself with the many relevant disciplines in which I had no prior formal education.

Over 150 scholarly articles from more than 70 academic journals, and more than 60 books were reviewed. At this point, I perceived a relative saturation of significant ideas, concepts and themes (Kvale & Brinkmann, 2009; Tracy, 2013). Accordingly, I deemed this review sufficient to inform my conceptual map (described below) and proceed to the next stage, which was selecting experts. Scoping exercises such as this are recommended in grounded theory to provide the broad, informed, and increasingly in-depth understandings required to develop the ultimate research questions and method (Suddaby, 2006).

49. A wildcard (e.g. ‘*’) stands in for different combinations of letters, enabling a broader search to be conducted within scholarly databases (e.g. searching for ‘ecolog*’ returns results for ‘ecology’, ‘ecological’, ‘ecologically’, etc.).

Reviewing topical and methodological literatures before conducting grounded research is valuable in loosely defining a research topic, but care must be taken during this phase to avoid assuming the main concern or research outcome (Christiansen, 2011). Accordingly, my topic was loosely defined, becoming more targeted as I proceeded to the concept map and selection of experts (detailed below). The literature I reviewed incorporated a diversity of disciplines and interdisciplinary works, and did not adhere closely to any “single substantive area” of scholarship; rather it was drawn from “several substantive areas that are frequently reflected in a given daily reality”; an advocated strategy for conducting grounded research (Suddaby, 2006, p.635).

Additionally, I practiced critical reflexivity throughout the review, examining my own biases. These were emphasised to me by the diversity of new literatures that I reviewed (and also later, by the experts). From my perspective, this meant that my conceptualisations, foci, and understandings evolved in a relatively grounded and reflexive way throughout the research process. Although the final emphases of my research were not inconceivable, I could not have foreseen these based on my initial understandings or review. In hindsight, this revealed the limitations, foci, and disciplinary boundaries of my perspective at the outset, but also demonstrated that neither my review, nor subsequent methods fixated on particular topics to inhibitive degrees. This is further demonstrated by the continual evolution of my conceptualisations over time, as discussed below.

4.2.2 Concept mapping

I consolidated the ideas derived from the literature into a conceptual map (Maxwell, 2013) with four perceivable ‘domains’ of knowledge entitled, Society, Stewardship, Habitat, and Future, respectively (Figure 3, below). Each of these domains is depicted as a blue circle, with my overarching research question ‘How then *could* we live?’ at the centre. Some disciplines and practices that I associated with each domain are depicted around the perimeter.

This conceptual map was developed with constant, evolving critical reflexivity as the literature review progressed. Such conceptual tools are useful for orientating the researcher within the topical landscape, directing research (in my case, a search of vast literature), and developing specific research questions (Witzel & Reiter, 2012). I began with broad, loosely defined analytical categories, within which novel ideas from across the disciplines could be placed into context conceptually, and better understood (Novak, 2010). These categories were ‘society’, embracing social elements and themes; ‘habitat’, accommodating ecological and physical elements; ‘stewardship’, comprising socio-ecological interactions; and ‘future’, encompassing both disciplinary forecasts and future-orientated literature (domains explained further below). Naturally, I had some preconceived ideas about what might arise from each category, and in line with my reflexive consideration of my own habitus, I have outlined these in Table 3.

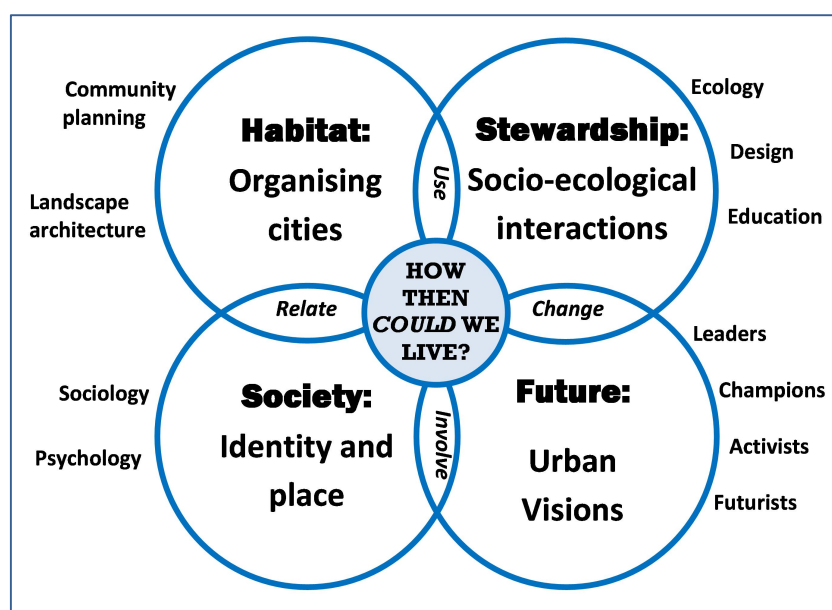


Figure 3: Conceptual map showing four domains of reviewed literature.

Table 3: Summary of my conceptualisations before the first literature review.

With an undergraduate degree in ecological science, I was most familiar with the habitat domain, perceiving this to include physical/material arrangement of cities, the ecologies/food-webs/biophysical relationships within cities, built infrastructure, and surface features such as buildings, streetscapes, plants, and animals. I viewed this to include disciplines such as ecology, engineering, planning, and architecture.

Stewardship was second most familiar to me, and I perceived this domain to include conservation of resources and biodiversity, awareness and protection of nature, and connection to nature. This included disciplines such as philosophy, ecological conservation, psychology, education, arts, and deep ecology.

Ideas I perceived for the society category were outside my previous formal education, but I grouped together disciplines such as politics, education, anthropology, economics, and design of cities. I expected that I would need further reviews of these literatures to familiarise myself with their relevance to socio-ecological issues in cities.

Pre-review, I was unaware of 'future studies'.

While the ideas shown in Table 3 shaped my initial search direction, the novel concepts and dynamics within the literature soon diverged from what I had expected, as research frequently does (Witzel & Reiter, 2012). These new understandings led to my more comprehensive and different conceptualisation of the topics as shown in Figure 3. The differences between Table 3

and Figure 3 demonstrate a shift and expansion in my understanding of the disciplines involved, and their differing structures, disciplinary terminologies, and relations. These understandings continued to develop over time, as elaborated upon in Appendix 3.

As my study progressed, I clarified the focus of the four domains, and although these were superseded after the interviews, I describe them here to transparently reveal the evolution of my thinking. Through further review of literature related to the ‘society’ domain, this came to focus on people’s identities and varying social, economic, political, conceptual and affective ties to physical places, including the values, attitudes, actions of (and interactions between) individuals, and groups within different city environments. The ‘stewardship’ domain focused on consideration of human protection and stewardship of the natural environment, and also the inverse relationship of humanity’s reliance on natural and built environments for survival and prosperity. This was linked to disciplines like conservation and ecology, education, and the role of design as a communication form for these things. The ‘habitat’ domain focused primarily on city planning, architecture, and related disciplines, incorporating city organisation and structure, and the various political and economic facets of urbanity, particularly their role in defining policy and material flows.

Most of the information gathered from the literature fell into these three categories, but it did re-define their meaning for me, and necessitated the creation of the fourth ‘future’ domain. This encompassed various disciplines, looking particularly at potential avenues and forms of change-making, future-orientated vision, innovation, and identifying who the leaders, activists, and champions of urban futures were. The ‘future studies’ literature, in particular, focuses on these ideas, and proved useful in my overall conceptualisations of socio-ecological futures and change (e.g. Phdungsilp, 2011; Ratcliffe, et al., 2006; Samet, 2013).

Additional features of the concept map include the central question, ‘How then *could* we live?’ that anchored the review, and the overlapping portions of the circles, which represents how some literature spanned more than one domain. The words ‘relate’, ‘use’, ‘change’, and ‘involve’ in Figure 3 describe the kinds of interactions, identified from the review, that occur between people and city environments. These terms help to demonstrate the interactive, dynamic, and trans-phenomenal nature of the domains and the associated disciplines. Respectively, they represent:

1. The organisation (and disorganisation) of cities and the dynamic links between identity and place, that affect how people ‘**relate**’ to the environment;
2. How socio-ecological relationships, in turn, affect the way societies ‘**use**’ their habitat;
3. How socio-ecological interactions, particularly when combined with future city visions can influence people’s aspirational or actual ‘**change**’ to city environments; and
4. How future city visions in combination with people’s place-identity highlight how people engage with, or are ‘**involved**’ in city environments.

These interactions are generalised and contestable, but were included for conceptual mapping purposes to organise my own emerging understandings of the literature, and demonstrate (and remind myself) of the fluidity of concepts between and within the domains and their linkages.

For the purpose of conceptual mapping, I also added examples of disciplines and practices around the periphery of the map, tying them loosely to the domains (although these also fall across domains). For example, I placed ‘ecology’ alongside the ‘stewardship’ domain, because of the various impacts that socio-ecological interactions can have on ecosystems, but ecology could equally sit alongside habitat, because biophysical (ecological) environments affect and are affected by cities’ physical/material organisation and structures. The final version of the conceptual map helped me refine the scope of my review, and was later referred to during expert selection and interviews, as detailed below.

4.2.3 Expert participant selection strategy

The Delphi technique (and all expert insight instruments) are only as good as the selected panel of participants (Linstone & Turoff, 1975). Therefore, intentional selection of experts who can inform the research aim is required. Armed with the conceptual map in Figure 3, I began compiling a shortlist of international experts from across disciplines (and the four domains) as potential interview participants. These were people whose work I had read directly, or whom I had otherwise identified through my literature search. The insights gained from the literature review and while developing the conceptual map helped to refine my research direction and sampling frame for selecting appropriate experts to interview (Morton-Williams, 1993). Selecting interview participants primarily for their expertise (Dexter, 1970), and building a sample as the study progresses (Edwards & Holland, 2013) are common characters of qualitative research.

In line with my research aim and objectives, I ‘purposively’ (Littig, 2009) selected individuals who fulfilled as many of the following criteria as possible:

- Addressed elements of one or more of my research questions in their own research or practice and were, therefore, thought to have significant relevant knowledge;
- Worked collaboratively across disciplines;

- Had publications or professional documentation of their work available in the literature or online, or were reported on within this literature;
- Took a forward thinking or future-orientated approach (versus examining past trends, for example);
- Took a pragmatic or solution based approach (versus describing the problem or focusing solely on theory); and
- Communicated using English (my study was confined to English literature and English speaking experts).

My sampling strategy was to select experts from a variety of disciplines, based on the outcomes of the literature review, and then to narrow this list towards a set of participants who would generate the primary data for the research. The selection was not intended to be complete, definitive, or exhaustive, but to maximise the diversity of ideas within the resource limitations of the study (Edwards & Holland, 2013), as described below. Selection also depended upon the experts' accessibility and I chose those whose online information provided contact details. In sum, the selection of experts resulted from my interpretive conceptualisation of the range of disciplines that needed to be included to comprehensively and meaningfully address my research questions. This sampling strategy was appropriate, as the aim of the interviews was to reveal a range of concepts from across disciplines to address the research aim (Flick, 2014; Tracy, 2013).

The initial list included 106 experts from the United States, Canada, the United Kingdom, Europe, South America, and Australia. One of the difficulties of studying up is that esteemed individuals are spatially dispersed (Nader, 1972) and in my case I found potential participants worldwide. I worked through the list, categorising experts by their perceived research domains and locations, and found that around 80% of the potential expert participants were based in North America. This was a reflection of several factors. Firstly my literature review was of English language literature, largely excluding some geographic areas; secondly, North America may trend towards academic and professional interest in solving such problems (as a group of developed countries with many socio/ecological problems); thirdly, the large comparative wealth, geographical scale, and population of North America means there are many academics, making it more likely that some will specialise in the precise niches that my research seeks to address.

When considering this geographical distribution of experts, and the limited three-year timeframe of my research funding, I decided to focus on the USA and Canada. This enabled me to access the greatest number of experts from the broadest range of disciplines within my means. Furthermore, North American experts, as English speakers, who were informed, opinionated, and practiced in articulating their research findings negated any need for translation. This offered some advantages to me, as a foreign researcher, as discussed in Chapter 3.

I narrowed the list of experts to a shortlist of 32 potential participants from North America who fitted closely with my expert ‘wish list’ above. This shortlist is included as Appendix 4. Their work collectively addressed all four domains from my conceptual map in a perceivably balanced way, with eight experts representing each domain. This balance was intended to maximise the range of perspectives and scope of resulting data across relevant disciplines to best meet my overall research aim.

Twenty of the shortlisted experts agreed to be interviewed, and I interviewed an additional five experts who I was referred to through ‘snowball sampling’. Snowball sampling is a recommended sampling technique for identifying and accessing additional interview candidates for whom there is no pre-existing sampling frame. This involves getting recommendations or introductions from participants to their associates. This potentially allows the researcher to contact unfamiliar and/or possibly hard to access individuals (Berg, 2009; Gray, 2014; Littig, 2009; Tracy, 2013). Some experts volunteered referrals to associates whose work might contribute to my research aim before I asked for these referrals (Bogner, et al., 2009). I followed up referrals where logistically possible. The same interview method was used in snowball interviews.

One of the limitations with snowball sampling is that referrals are correlated to those who suggest them, which may be problematic if independence is sought. This was offset in my research to a degree because the experts were aware of others I had interviewed, and consequently recommended people who might add to my data set. One expert did suggest a colleague from his organisation, but considered that her perspectives would differ sufficiently from his own to provide additional diversity (which was indeed the case).

Another limitation of my study was that the majority of the interviews had to be planned ahead of time, and because of the time and financial constraints involved, the number of possible interviews was limited. Ideally, identification and interviewing of experts may have continued until saturation of novel insight occurred (Edwards & Holland, 2013). Although this diminished during the course of my 25 interviews, every interview offered different understandings. However, importantly, the interviews generated a sufficient abundance of data to respond to the research aim, which is also a valid basis for concluding data generation (Edwards & Holland, 2013).

The 25 experts who were interviewed are listed in Table 4, below. These experts were relatively balanced across the four conceptual domains in Figure 3 (seven from stewardship; and six each from society; habitat, and future, respectively). However, as I conducted the interviews I came to realise that this balance was largely immaterial, as all experts identified themselves and their work as occurring across more than one of the domains, and 15 of the 25 identified with all four of the domains, and indeed the entire diagram.

Table 4: List of 25 interviewed experts and their roles circa 2012.

Name	Role in 2012
Aryne Sheppard	Senior Public Engagement Specialist at the David Suzuki Foundation.
Barbara Deutsch	Executive Director at the Landscape Architecture Foundation, Washington DC.
Beverly Sandalack	Professor of Environmental Design Practice at the University of Calgary.
Blake Poland	Associate Professor at Dalla Lana School of Public Health, Toronto.
Bruce Morito	Associate Professor of Philosophy at Athabasca University.
Clark Wilson	Environmental Protection Specialist and Urban Designer at US EPA.
David Beach	Director of GreenCityBlueLake; writer, editor, and community activist.
Debbie Kasper	Lecturer in Environmental Studies at Hiram College.
Ellen Dunham-Jones	Professor of Architecture and Urban Design at Georgia Institute of Technology.
Greg Searle	Executive Director of BioRegional North America.
Ingrid Stefanovic	Professor of Philosophy at the University of Toronto.
Janice Perlman	Founder and President of The Megacities Project.
Juliet Schor	Professor of Sociology at Boston College.
Kristen Miller	Executive Director of Ecocity Builders.
Margie Ruddick	Landscape architecture consultant, teacher, lecturer, and writer.
Mia Lehrer	President of Mia Lehrer + Associates; Fellow of American Society of Landscape Architects.
P. Wesley Schultz	Professor of Psychology at California State University, San Marcos.
Randy Haluza-DeLay	Associate Professor of Sociology at The King's University College.
Richard Louv	Journalist, author; founding chairman of Children & Nature Network.
Richard Register	Artist, writer; founder and president of Ecocity Builders.
Robert Costanza	Professor of Sustainability at Portland State University.
Stephen R. Kellert	Tweedy Ordway Professor Emeritus of Social Ecology and Senior Research Scholar at Yale University.
Susan Clayton	Professor of Psychology and Environmental Studies at The College of Wooster.
Timothy Beatley	Teresa Heinz Professor of Sustainable Communities at the University of Virginia.
Walter J. Hood	Founder of Hood Design; Professor of Landscape Architecture, Environmental Planning, and Urban Design at University of California, Berkeley.

The reflexive approach I chose to practice in this research meant that I was constantly reviewing my conceptual understanding of the topic. Therefore, although the conceptual map proved to be a useful tool for understanding the literature and constructing the initial phases of the research, it was eclipsed by my developing conceptual understandings. These emerged from the research process itself, especially as a result of my critical reflexivity during data analysis.

4.2.4 Design of interview guide

This section describes part of my response to Objective 2 of this research: to design a qualitative expert interview instrument and execute this to generate interdisciplinary expert insight and foresight that responds to the research aim. This step was informed by my methodology (Chapter 4), and ultimately structured the interview process. I followed a qualitative and semi-structured format when designing the interview guide, which occurred iteratively⁵⁰ throughout the literature review and conceptual mapping stages. The guide was later refined in response to pilot interviews (described below), which I undertook prior to the main field research.

Table 5: Ten main interview questions. Standard additional questions and prompts that I used are provided in Appendix 5.

1. Which bubble *domain** do you identify *yourself or your work* with?
A copy of Figure 3 was presented with this question.
2. How did you come to be in your current line of *work/research*?
3. What was influential to you in developing a relationship with or interest in the natural environment *to begin with*?
4. How is your work similar to or different from the work of other people who have the goal of creating cities that promote ecological sensitivity in society?
5. To what degree do you think there is collaboration across the disciplines involved in these issues?
6. What are the most pressing environmental issues that need addressing in your geographical urban area and in your discipline?
7. At what level is the drive for change and initiation of these ideas required to be successful?
8. What do you think provides the best opportunity for meaningful powerful incorporation of nature into cities and the everyday lives of city people?
9. What do you perceive is the main barrier to implementing these ideas?
10. How might these barriers be overcome? *Do you think it is possible?*

*Changes added during the course of the interviews are shown in italic.

The interview guide was to provide myself with orientation during the interviews, and set the ten main questions that I would present to each expert. The same ten open-ended questions (Table 5) were asked in every interview, with a selection of potential follow up questions/prompts (detailed in Appendix 5). This provided some structure of ideas to cover, as is recommended for such interviews (Edwards & Holland, 2013; Flick, 2014; Kvale, 1996; Tracy, 2013), while enabling the experts to pursue trajectories of importance to themselves as well.

50. Iteration describes repeating a process, building on the outcomes each time to reach a targeted point; this was a principle of my methodological development, and is discussed further below.

The final interview guide that I printed to use in each interview is included as Appendix 5. I did not offer this to the experts, but provided them with a sample list before the interview to demonstrate the types of questions I would be asking, upon request (detailed in 4.3.1). The guide also contained a space for writing notes and timing the interview, and a reminder for myself at the end to ask for feedback on the interview and anything that had not been covered, and to request recommendations for indispensable resources, in situ examples of sustainability initiatives, and snowball recommendations for other experts (Gillham, 2005).

I improvised the wording of some questions during the interview process in response to feedback from the experts (the most used alternatives are shown in italics in Table 5). For example, some experts' work did not focus on research, so I reworded Question 2 to suit this, and Question 8 was quite long and confusing to some experts, so I divided it up. I also spoke more slowly, and reiterated some of the information about my research project, which I had sent them in advance (this priming is outlined below). Conducting all of the interviews myself was of major benefit, as it provided an overview of what was said in each interview, and the nuances of the discussions that were had. This enabled me to adjust my wording as described above, and to critically review my understandings as I went (Flick, 2014).

The tone of the interview and the set of questions were intended to be exploratory. Deploying high order questions was intended to prompt the critical exploration of ideas, recollection of experiences, and revelation of philosophies, thus indirectly eliciting responses of relevance to my research. This approach follows the “theory generating” expert interview strategy outlined by Bogner and Menz (2005, as cited in Littig, 2009, p.101), which exposes the explicit specialised knowledge of experts, while enabling the revelation of the reasoning behind ideas (“tacit specific interpretive knowledge”), and the reality of their application in practice (“procedural knowledge”). This approach can be contrasted with ‘systematising’ expert interviews, which seek only the ‘objective’ knowledge of a particular field. I did not include any quantitative (e.g. demographic) questions for statistical purposes or to control for biases in the responses, as my primary intention was to gauge the range of thinking across different disciplines (which I selected deliberately, as discussed above).

The opening interview question employed the conceptual map from my literature review (Figure 3) as an elicitation device, which also served as a primer for the experts to consider the scope of my study and its implications (Edwards & Holland, 2013). Questions 2 & 3 focused on the experts' research background and interest in environmental and city issues, which provided some background on their personal and professional biographies (and habitus). Questions 4-5 covered experts' experiences with collaboration and interdisciplinary approaches, and allowed for discussion of their role/niche within city-futures and socio-ecological fields. Questions 6-8 were specifically focused on eliciting the experts' perspectives on pressing environmental issues,

societal change, and city ecological habitus. Questions 9-10 prompted them to identify and discuss barriers to change and future opportunities for overcoming these barriers (Edwards & Holland, 2013).

4.2.5 Pilot interviews

Several weeks before commencing fieldwork, I conducted pilot interviews with New Zealand academics, using the interview guide that I had prepared for the expert interviews. I had previously discussed and revised the interview questions with my supervisors, but sought additional ‘outsider’ perspectives, and to practice my interviewing technique. The objective was to identify difficulties with the questions, ambiguities in the wording, technicalities of audio recording, and to test the interview guide in practice.

Based on this exercise, I made a few administrative revisions to my approach and noted some strategies for facilitating the official interviews. Firstly, I reduced the number of words and increased the font size of the questions in the guide, enabling me to more rapidly reference this during the interviews. I also realised I would need more space to take notes, and compressed the questions, minimised the page margins etc., to facilitate this. I also found that placing the recording device (which displayed the elapsing interview time), too near to the expert (to capture their voice) meant that I could not monitor interview timing. I purchased an ancillary/label microphone with a lead that I could place near to the expert to resolve this issue. Other than these issues, the pilot interviews proceeded without any hiccoughs, and prepared me well for the eventual expert interviews.

4.2.6 Ethical approval

With the shortlist of 32 experts and the interview format drawn up, I submitted a notification of low-risk research involving human participants to the Massey University Human Ethics Committee. A low-risk approval was given, and the following protocol accepted:

- Participants (experts) to be provided with an information sheet outlining the purposes of the study and uses of the interview data prior to the interview taking place;
- Participants to be informed that they will be identified in their expert capacity within the research, and offered a summary of the interview recording on request;
- Participants to be informed that the interview will be audio recorded; and
- Participants to be informed again of the above terms within the interview, after which they will be invited to sign a participant consent form to confirm their understanding and consent to these terms.

These terms were all adhered to. Appendix 6 contains the information sheet that experts were emailed with their invitation, and offered in person prior to their interview. Appendix 7 contains the participant consent form that each expert signed having sighted the information sheet, and before recording began.

4.3 EXPERT INTERVIEW PROCEDURE

This section describes the procedures of conducting the interviews, reporting my response to Objective 2: to deploy a qualitative expert interview instrument to generate interdisciplinary expert insight and foresight that responds to the research aim. Face-to-face, telephone, and email interviews are covered. It details the processes from initial contact and invitation of the experts, through to processes within the interviews, and exiting from the interviews.

4.3.1 Initial contact, priming, and logistics

Communication with the shortlisted experts began in mid-July 2012. This was three weeks before the first proposed interview dates, and sixteen weeks before the final dates. This seemed an effective period of notice, with experts tending to be fully booked for a couple of weeks ahead of time and also reticent to commit to dates and locations more than a few months in advance.

Contact details for each expert were sourced online within institutional or professional profile pages. Initial contact was made by phone, where possible. This initial contact was made by my PhD supervisor at the time, who was then an Associate Professor. I viewed that his position of institutional authority would potentially provide him with more successful access to the experts. Experts might view him as a peer in this role, and therefore be more forthcoming than if approached by a PhD candidate.

Sometimes multiple attempts to call were made (accounting for time differences) and if necessary, an answer-phone message was left. Persistence is recommended in garnering responses from experts (Undheim, 2003), and the benefit of calling was that we could be sure that contact was made. This was promptly followed with an email from me. In the email I invited each expert to participate in a one-hour interview, and provided them with two attached documents: my proposed field research itinerary with a choice of several dates for each expert and the shortlist of 32 proposed experts (Appendix 4), and an information sheet about my research (Appendix 6). Some experts requested a list of sample questions/topics to consider prior to the interview, which was provided (Appendix 8). These questions were preliminary only and were not identical to the questions used in the interviews.

I conducted all of the face-to-face interviews and the telephone interview (detailed below) between August 7th and December 6th, 2012. The email interview took more time to complete and was finalised in 2013. The face-to-face interviews took place in a variety of settings, including academic and government offices, university libraries, professional workspaces, private living rooms, and busy cafés. My first face-to-face encounter with each expert was generally at the interview itself, unless they had offered their hospitality prior to this. The majority of interviews lasted one hour. I ensured that the questions from the interview guide were covered within this hour, and indicated their completion accordingly, but let the interviews run beyond this at each expert's discretion (exiting the interview is discussed further below). The shortest interview (the telephone interview), ran for half an hour, while the longest face-to-face interview ran for nearly three hours. Several experts invited me to join them for a meal or local activity after the interview.

4.3.2 Face-to-face interview preliminaries

Each interview began with a meet and greet, unless I had met with the expert beforehand. I tried to match the tone set by the expert throughout the interview, tending towards formality if I was unsure. Experts were usually very interested to learn how I had negotiated my way to the interview, how my fieldwork had gone so far, who I had interviewed previously, who else was on my list (some did not recall the details of the itinerary), and what my motivations were for such a research project. However, I generally tried to begin the interview promptly, so that I could secure their consent to begin recording, and make sure to capture key discussion.

I took four documents with me to each interview (exemplars in Appendices 5-7):

1. The two page interview guide for my own reference and note-taking;
2. The information sheet about my research and the recording protocol etc.;
3. A consent form for the expert to sign; and
4. A copy of my conceptual map (Figure 3) that I used as an aid for the first interview question.

Ross (2001) advises that an interview guide (providing guidance for the interview process) can also act as an 'official' instrument within the interview (i.e. making the researcher the person 'holding the clip-board'), which can offer a degree of authority, and help to offset the power imbalance that can occur when studying up.

I began the official interview by offering experts a printed copy of the information sheet. All experts had been sent this prior to their interview, but some chose to refresh their memories by reading over it again. This outlined the purposes of the study and my potential uses of the interview data. I also told each expert a little about my own background, answered any further questions they had, and then invited them to sign a participant consent form to confirm that they had understood the information provided, that I could identify them in their expert capacity within

the research, and that the interview could be audio recorded (in line with the terms of my ethics approval). All experts consented in writing.

4.3.3 Audio recording protocol

Once consent was given, I began audio recording. I used a Philips LFH0635 digital audio recorder supplied by Massey University (and my Samsung S5620 mobile phone for the telephone interview) and an ancillary/lapel microphone, which I placed near to the expert. It was usually impractical for the expert to actually wear the microphone (i.e. on their lapel) as it was attached to the recorder (which I had to operate) via a cord, and the seating arrangement varied by interview. I also wrote notes on the interview guide, with the aim of documenting the fundamentals of each interview should the digital recorder fail (this did not happen). I usually left the recorder going until I left the interview space to catch any spontaneous post-interview insights (T. Farrelly, 2012, pers. comm.). This strategy successfully captured discussions that sprang up after the official interview concluded.

Audio recording is standard for interviews, enabling attentive interaction between the researcher and participants, and repeated analysis of discussions post-interview (Edwards & Holland, 2013). While word-for-word analysis was not a requirement of my research approach (i.e. I was not aiming to capture emotional responses such as laughing, etc.), I found the recordings to be invaluable later during the analysis, as some of the significant elements of the data set only became clear to me when listening to them again after subsequent interviews, and after further reviews during my analysis (see Chapter 5). The complete audio record of the interviews allowed for this in a way that written notes alone would not have.

4.3.4 Application of interview guide within face-to-face interviews

Recording signalled the beginning of the official interview (i.e. beginning the questions in the interview guide). The ten questions were presented in order, unless a question was well-answered prematurely in response to a previous question, in which case I would skip that question (Flick, 2014). I used the additional questions/prompts listed in the interview guide to encourage further dialogue where necessary, as well as other interview probe techniques such as silence, echoing responses, and asking for elaboration (Bernard, 2000).

When experts gave tangential answers, I usually indulged them to a degree, waiting for an appropriate time to interject and redirect the discourse towards topics of relevance to my research (Edwards & Holland, 2013). This approach reinforced the benefits of a semi-structured format in enabling both broad scope and structured direction when studying up (Gillham, 2005; Morton-

Williams, 1993). The visual layout of the interview guide was useful for monitoring the timing of the interview and ensuring that too much time was not spent on any one question or tangent.

4.3.5 Telephone and email interviews

One telephone and one email interview were conducted, where experts were not logistically available for a face-to-face interview, but were willing to participate in the research during the time allocated for the fieldwork. The information and consent documents and conceptual map (referred to in the first interview question) were emailed to these experts in both cases, and the main questions from the interview guide were emailed through as part of the email interview (Appendix 9).

The telephone interview followed the interview guide, and lasted only half an hour. In this interview the expert gave very short answers before asking to move on to the next question, or directed me to read their publications in response to each question. The email interview participant gave similar responses, many of which I followed up in an additional set of written questions (Flick, 2014). The second round of questions was responded to with single sentence answers and circular references and thus the interview was concluded.

4.3.6 Exiting the interview

The face-to-face interviews were concluded in various ways. In most cases, shortly before the allocated hour concluded, I would tell the expert that we had covered all of the questions from the interview guide, and the interview would wrap up naturally with thanks from me, and questions from the expert about my itinerary, interest in future progress, and advice about things to see and places to visit in their city. A few experts continued the discussion beyond the hour, and/or extended additional hospitality to me, as noted above.

After each interview, I reviewed my hand-written notes, ensured that they provided an adequate outline of the interview, and added any further points that were required. I usually did this the evening after the interview, although sometimes I would do this right away. I would also follow up promptly with any time-sensitive points of action, such as visiting local projects, or attempting to set up suggested snowball interviews. I carried a notebook that I used daily to note travel times, addresses, reference numbers, etc., and frequently used this to note thoughts and revelations as I consciously and sub-consciously digested and conceptually integrated what was covered in the interviews. This constituted a research notebook that I referenced in my later analysis.

4.4 CONCLUSIONS

This chapter reports on my response to Objective 2 of this thesis, deploying an expert interview instrument to generate interdisciplinary expert insight and foresight in response to my aim. The breadth of expert insight (and corresponding literature) taken into consideration through this process is a defining feature of my method. It began in the initial stages with my interdisciplinary literature review and the development of a conceptual map (with four ‘domains’) to portray this review and inform the selection of potential expert candidates. It was also a prominent feature of the interviews themselves, which engaged experts from across disciplines.

This chapter detailed the design and execution of my expert interview instrument. It responds to a relative scarcity of such accounts in the published literature. Replicability was not intended, in accordance with qualitative interviews methodologies of this nature. Rather I pursued a transparent depiction of my process, which may be of value and direction (or a source of critique and development) for other students or scholars.

Each stage of my data collection involved learning and adaptation, from designing the interview guide and conducting the pilot interviews; to contacting and priming experts; entering, conducting and existing the interviews; and coping with the challenges of interviewing experts. While this represents the completion of my interview phase, it was by no means the end of my research method, which continued with data analysis, as discussed in the next chapter.

Chapter 5

ANALYSIS METHOD

5.1 INTRODUCTION

This chapter discusses the methodology and methods of my data analysis, detailing the process of my research after the interviews. The first step of analysis was transcribing the interviews. This was invaluable to my understandings, but not straightforward. I describe the method and methodology of transcription first. Then the bulk of the methodology that underpins the next steps of the analysis is discussed, focusing particularly on coding methodology. The remaining method is then chronologically covered, from coding raw data through to developing and theoretically framing key research themes (i.e. backcasted pathways). Further methodological notes are included where relevant to tie my methodological reasoning closely to each step of the method. This is appropriate for my mixed-method and iteratively developed reflexive research protocol.

During parts of the analysis, interim outcomes informed my subsequent analytical decisions and methodological pathways. To facilitate a clear explanation of how this process proceeded (and avoid abstraction) I include concrete examples of interim outcomes and explain their role in the analysis. These are not the same as the final results of my research, which are presented later in the thesis.

Alongside my analysis, particularly the later, thematising stages, I was also developing the ecological habitus framework for conceptualising and assessing pragmatic change towards sustainability. This ecological habitus framework is what directed my final thematising (where I constructed backcasted pathways from the interview data). At the end of this chapter is an overview of this parallel theory development and data analysis process, with more theory details following in Part II of the thesis.

5.2 METHODOLOGY AND METHOD OF TRANSCRIPTION

Upon returning to New Zealand, the first stage of my analysis was to transcribe the interview audio recordings. Transcribing qualitative interviews is acknowledged as the first stage of data analysis and a critical part of the analysis process (Tracy, 2013). This is because transcribing develops a researcher's close familiarisation with the data (Langdridge, cited in King & Horrocks, 2010),

progresses their continually developing understanding of the data (Tracy, 2013), and entails interpretation of the data and construction of the transcript as a response to the research aim (Kvale & Brinkmann, 2009; Tracy, 2013).

I focused on accurately capturing the “thematically relevant passages” (Meuser & Nagel, 2009, p.35) of each interview, and summarised those that were tangential to the research aim (e.g. interruptions, or questions about my background or travel plans), a standard approach when transcribing expert interviews. The intention was to avoid unnecessary data volume, while remaining true to the interview dialogues, and to generate transcripts that could respond to the research aim. Later, as I isolated key topics and themes from the interview data, and when I sought quotes from any summarised passages, I returned to the original recordings to type out these sections in full. Ultimately, these transcriptions totalled more than 160,000 words (500+ pages). The face-to-face interview transcripts averaged around 7000 words each, while the text from the email interview included far fewer words (around 1600), and the transcript from the telephone interview also reflected its shorter duration (~5000 words).

Some of the interviews were conducted in large, resonant, or noisy public spaces (e.g. libraries and cafes), resulting in poor quality audio recordings. This was partly a consequence of allowing the experts to choose the location of their interview, and was not foreseen when testing the recording device in the small, quiet offices of the pilot interviews. I learned and used the open-source software program Audacity (version 2.0.3) to reduce distortion and static in the audio recordings as I transcribed. This achieved better quality playback in some cases, but was time consuming. This issue might have been foreseen had I tested the recording device across a diversity of settings beforehand.

Better quality recordings may also have been achieved using video. While experts are unlikely to be phased by being ‘on the record’ in this way, as other interview participants might be (Kvale & Brinkmann, 2009) this would have imposed additional formality onto the interview. Furthermore, it would probably have required an inhibitive degree of logistical difficulty (e.g. setting up a tripod or other recording equipment beforehand and transporting this heavier equipment). Selecting a quiet interview space myself was precluded, as I would often arrive in a city hours before an interview. This would also have required greater effort on behalf of the experts, potentially reducing their interest in participating. However, I might equally have stipulated the need for a quiet location (e.g. private office) when inviting their participation. Sourcing a better quality, compact recording device and better quality, more practical microphone (i.e. with a longer cord, or wireless) would have been ideal, but this would have added considerably to my (already over-stretched) research budget.

The technical playback difficulties were compounded by the experts’ accents and nomenclature. I could not rely on recognising familiar phrasing when deducing what was being said, and frequently had to listen to incomprehensible segments repeatedly before resuming transcription. I did not expect

this when interviewing North American English speakers. The different arrangement of words within phrases (compared to NZ English), and the use of informal words like ‘critter’ and ‘folks’, or American alternatives of words like ‘woods’ instead of ‘forest’ (or the NZ colloquialism: ‘bush’) were comprehensible in person, but could be difficult to discern in their unanticipated incongruity when transcribing. Accordingly, conducting both the interviews and the transcriptions myself, as opposed to employing an interviewer, transcriber, or translator (had I chosen foreign language speakers), as is done by some researchers, made interpreting the audio somewhat easier.

Additionally, conducting all stages of research oneself provides benefits during interpretation and analysis (Meuser & Nagel, 2009). Firstly, I had experienced and could recall the communication style and expressive intent of each expert from the face-to-face encounter. This, combined with my background knowledge of the experts (e.g. reading their literature and online profiles), provided me with a contextualised understanding of each expert as well as the contents of each interview. Abstraction from the data, which occurs especially when transcription is outsourced, was thereby reduced (Kvale & Brinkmann, 2009). Secondly, this approach offered consistency of interpretation and process across the transcription and analysis (Kvale, 1996). For example, I did not have to reach mutual understandings or ensure consistency of process among numerous transcribers. Conducting transcription oneself also circumvents additional research costs, and the need to cross-check the transcripts (Tracy, 2013). Furthermore, the insight into interview methods that can be gained through transcription (e.g. listening to interview procedures afresh and evaluating these as effective/ineffective) and corresponding opportunities for self-reflection are fundamental learning opportunities for qualitative researchers who seek to improve their interviewing craft (Kvale & Brinkmann, 2009; Tracy, 2013).

One unavoidable variable was that my own understandings developed along the way. However, I mitigated against the effects of this by returning to reflect upon all interview data repeatedly as my understandings developed, and report on these developments openly herein. This is a recommended practice in grounded theory analysis (as discussed next) and reflexive research (Tracy, 2013).

The above points further highlight the analytical nature of transcribing, and demonstrate the necessity of viewing transcripts as part of the “continuous unfolding” (Kvale, 1996, p.183) of meanings within research, and not discrete units of information. The transcripts themselves are a product of the co-constructed interview dialogue, the transcriber’s interpretation of the audio recordings, and the researcher’s (nevertheless considered and valid) filtering of which passages to include or omit, in accordance to the research objectives (Kvale & Brinkmann, 2009; Tracy, 2013). As Kvale and Brinkmann describe, there is no “true, objective transformation” of spoken to written word (2009, p.186). A transcription is rather a human construct, and should be viewed as part of the analysis and used as a tool to respond to the specific aim of the research (Kvale & Brinkmann, 2009). With this in mind, I worked to complete the final transcriptions in parallel with beginning the next step of the analysis, to benefit both, and frequently referred back to the transcriptions and the

original audio recordings throughout the remainder of the research, as is recommended by interview methodologists (Kvale & Brinkmann, 2009).

5.3 METHODOLOGY OF CODING AND BEYOND

The next phase of the analysis was inductive, drawing on grounded theory (Glaser & Strauss, 1967) to engage with the interview data, and determine which topics the experts focused on during their interviews. This approach is appropriate for descriptive and theory-building research (Berg, 2009; Bogner, et al., 2009; Deming & Swaffield, 2011; Kvale & Brinkmann, 2009), as well as issues of rapid social change, where existing theory cannot keep pace with evolving knowledge and practice (Flick, 2014). Hence, its suitability within my research, where there was no evident pre-existing framework that I could apply to synthesise my data into a cohesive whole, what with its diverse disciplinary origins, personal and professional components (i.e. the ‘grey area’ discussed in 3.3.2 and 3.3.3), and my goal of identifying pragmatic pathways to creating socio-ecological change (itself a dynamic and evolving research area).

Grounded analysis is an interpretive process, involving identifying key words and concepts from the data, and sensitively developing categories and themes that reflect these (Suddaby, 2006). As discussed above, conducting the interviews and transcriptions myself was invaluable to the depth of understanding that I achieved and could bring to the analysis. This was furthered by my choice of manual data coding⁵¹ (as opposed to software based alternatives), which I discuss further below. By the time I had drafts of each transcription, I had already spent many months immersed in the data, and had a strong and nuanced grasp of what had emerged from the interviews, both individually and as a whole. Obviously, this continued to grow as I proceeded.

I used a ‘bricolage’ approach to coding the interview transcripts (Kvale & Brinkmann, 2009). This approach is prevalent in interpretive analyses for meaning-making research, and uses an informed “interplay” (Kvale, 1996, p.203) of techniques, as appropriate, to bring out connections in the data and generate structures of relevance to the research aim (Kvale & Brinkmann, 2009). As part of this, I applied a series of different analytical techniques, which I detail next.

There is no standardised method for such analyses, which are non-linear and require an iterative approach (Glaser & Strauss, 1967; Kvale, 1996). In this context, iteration involves constant comparison of the original data and research aim with the emergent codes and interpreted themes, which are refined accordingly (Suddaby, 2006; Tracy, 2013). In my first round of analysis, this involved repeated consideration of the interview data. In the second round, it was further complicated as I began the parallel development of the ecological habitus framework as a way to

51. Coding involves assigning keywords to segments of text for classificatory purposes (Brinkmann & Kvale, 2015).

theoretically conceptualise the interview data. Kvale and Brinkmann (2009, p.111) describe this expositively as “spiralling backwards”, where the novel insight generated through analysis compels revisitation of earlier analytical stages in a series of iterations. As described in previous chapters, this corresponds to the approach Bourdieu applied in his own research. In my case this occurred throughout the coding, mapping, and thematising stages of the analysis, and involved an iterative, non-linear (i.e. recursive ‘spiralling’) consideration of the interview data. Simultaneously, I was aligning the interview analysis with the theoretical development and its complexities. These dynamics are discussed more in the next sections.

Iterative analysis is a “deeply reflexive process” (Srivastava & Hopwood, 2009, p.77) consistent with the methodological foundation of this thesis. Reflexive iteration allows the more sophisticated understandings that only emerge in the later stages of the analysis (sometimes months or years into the research, as I discovered) to be captured within the analysis and correspondingly woven cohesively into the research results (Luker, 2008). This enables complex, insightful, and refined meanings to emerge from the data (Scott, 2004; Srivastava & Hopwood, 2009). Simultaneously, I was developing my capacity for and understandings of reflexivity, and specifically, the ecological strain of reflexivity discussed and developed in the next chapters. In addition to gradually focusing my analysis upon the themes that I ultimately sought (in response to my research aim), this added layers of richness to my understandings and interpretations as I proceeded with my analysis.

As highlighted earlier, conducting the research independently, using manual coding, and building on my understandings throughout these steps supported me in developing sensitised analysis and outcomes. This contrasts to more mechanical applications of coding, which often lack “the spark of creative insight” (Suddaby, 2006, p.638) sought in grounded research. My approach furthermore enabled a closeness to the data that is lost using coding software (Knight & Ruddock, 2008).

These approaches also presented some drawbacks. Qualitative research requires extensive data analysis, often necessitating a research team (Kvale, 1996; Witzel & Reiter, 2012), and my independent and manual approaches (in contrast to employing software and/or assistants), compounded the onerousness of the undertaking. Interview analyses are often “terminated because of time limits or exhaustion” (Kvale, 1996, p.188), before thematic or analytic saturation occurs or the desired level of understanding is achieved. The analysis certainly took much longer than I ever anticipated, and my understandings continue to grow despite nearing completion of my PhD.

There is also a converse risk, with manual techniques, of becoming too close to the data and losing sight of the “wood for the trees” (Johnston, 2006, p. 323, as cited in Knight & Ruddock, 2008). Coding and mapping the data visually (illustrated below) enabled a degree of metacognition (i.e. perception of the ‘bigger picture’), which was valuable to this end (Kvale, 1996). The use of reflexive iteration throughout the analysis further led to my considering the data from a multitude of

angles and at different stages of the research, both formally as reported here, and informally in my everyday life. Over a protracted period this provided me with what I view to be an ample perspective of the data, contextualised robustly within the larger research frame (i.e. in terms of theory and in terms of my aim), without necessitating mechanical abstraction, such as software-based coding.

5.4 METHOD OF CODING

Analysis of the interview transcripts began with grounded coding, development of a conceptual network for visualising the data, and identification of key topics. These topics were ultimately assembled into three main themes, which each took the form of a backcasted pathway. This stage of the data analysis informed, and was informed by my theoretical developments around ecological habitus. Finally, a data matrix and literature reviews were engaged to cross-check and verify the research outcomes. Each of these steps is discussed next.

5.4.1 Data coding, creating a conceptual network, and identifying key topics

Coding was the next stage of the analysis. I began coding as I transcribed, and intensified this phase once the transcripts were completed. In line with grounded theory (Glaser & Strauss, 1967), my initial approach was ‘open coding’. This process isolates relevant segments of the data, and assigns descriptive labels to each segment, allowing key ideas from across interviews to emerge from the data, rather than being prescribed in advance (Tracy, 2013). This is a typical approach in descriptive and theory-building research methodologies (Berg, 2009; Bogner, et al., 2009; Deming & Swaffield, 2011; Kvale & Brinkmann, 2009).

In practice, this first stage involved open coding onto sticky-notes (i.e. post-its), where I noted interview content that was emphasised or repeated by one expert, or mentioned by multiple experts. I began with manually extracted ‘in vivo’⁵² codes (i.e. quoting expert’s phrases directly and noting who said what). Later I began to code more complex ideas, using condensed and simplified language of my own to summarise what was said (Kvale, 1996; Tracy, 2013). I listened to every interview recording at least four times during the analysis process and iteratively added to the body of codes as I proceeded. This involved constantly interpreting and comparing what the data was “telling me” with what I aimed to find out (i.e. my research aim and objectives), and reflecting on how the two interacted (Srivastava & Hopwood, 2009, p.78). About 150 distinct codes were created during this stage, each on a separate sticky-note (Figure 4). When two or more experts expressed very similar

52. This phrase stems from a Latin root, meaning ‘in situ’. It is not to be confused with the data analysis computer software ‘NVivo’; I did not use software for data coding or analysis.

ideas, I would note both names onto the sticky-note containing that code/idea. Appendix 10 presents one page of coded text as examples.

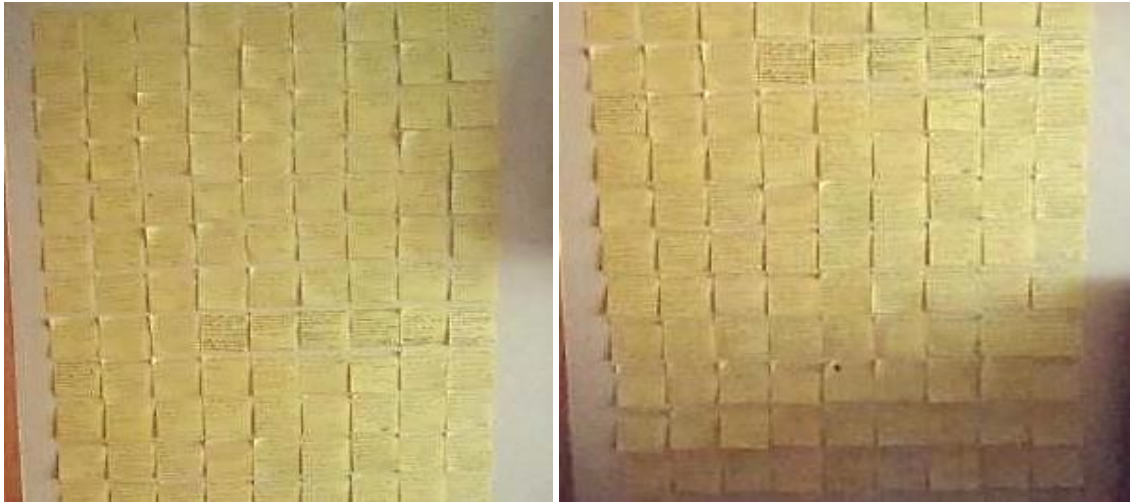


Figure 4: Photograph showing individual sticky-notes used in primary coding.

During and after this, I conducted axial coding. The purpose of this was to experiment with combinations of codes, creating novel assemblies until, iteratively, the complex relations between individual codes were ‘mapped out’. I describe this array as a ‘sticky-note network’ (Figure 5, below). This process was particularly pertinent to my research, because it enabled analogous terms and concepts from the different experts’ disciplines to be aligned. Cross-interview analyses of this type are what enable the recognition of broader themes that are scattered amongst interviews (Meuser & Nagel, 2009). In this case, many of these occurrences were not revealed during the initial process of open coding interview-by-interview.

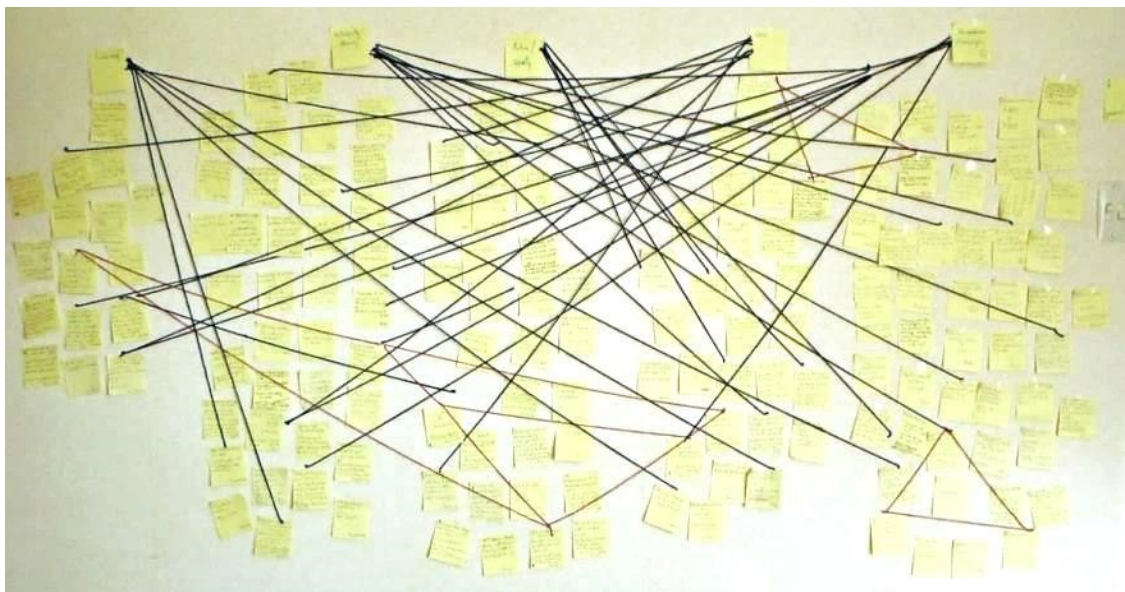


Figure 5: Photograph showing the sticky-note network stage of analysis.

To begin with, my axial coding involved spatially arranging and rearranging the sticky-notes intuitively, comparing and contrasting each contained code, and creating categories with conceptual commonalities that I clustered contiguously (Maxwell & Chmiel, 2014). As I proceeded, I routinely referred back to the interview data, returning to open and axial coding where necessary to incorporate additional insights and fill perceivable gaps. I continued this iterative visual arrangement, adding codes where needed, until I perceived a saturation of codes coming from the data (Kvale & Brinkmann, 2009). At this point, I considered that the network accurately reflected my understandings of the interview data.

In practice, this process was supported by the analytic memos that I had made throughout the research, particularly those recorded during analysis (Thornberg & Charmaz, 2014; Tracy, 2013). These recorded my conceptual development process, including potential links that I saw between codes and existing literature as well as questions or hypotheses that arose. These memos, in turn, were informed by my personal academic (and practice-based) background and understandings, previous literature reviews, my experiences with the experts, and the visual and conceptual organising of the codes that I was undertaking. Later, as I moved my focus to developing upon ecological habitus theory (detailed in Chapter 6); this became a focus of further memos.

The completed sticky-note network represented another completed stage in the analysis process. It was made up of five broad categories of codes. These are shown in Figure 5 as vertical columns of sticky-notes, each topped with a category title. The network included 181 sticky-notes in total (consisting of 176 individual codes, and five category titles). The categories, in order from left to right, were informally, but descriptively titled: 1) ‘Greening’; 2) ‘Inclusivity & sharing’; 3) ‘Future/society’; 4) ‘Cities’ [as physical places]; and 5) ‘Perceptions & messages’.

Each code was within the category that I perceived it as most strongly contributing to, based on my understandings of the code’s inherent meanings and my definition of each category. However, because the codes were deconstructed to a relatively abstracted, topical level, and the categories were relatively broad, many of the codes held relevance to multiple categories. For example, one code was for ‘nearby-nature’⁵³, which I placed into the ‘Greening’ category, as it was described to me in the interviews as something that revolves around having ‘green’ elements within cities. However, this code was also relevant to the ‘Cities’ [as places] category, as nature in cities was described variously by the experts as affecting the way that infrastructures and the physical construction of cities operate. For example, trees within cities reduce the reflected solar heat from hard surfaces, and absorb storm water that would otherwise enter storm water systems. This reinforces the value of my understanding of each code’s original context within the interviews.

53. ‘Nearby-nature’ describes environments with routinely and equitably accessible natural elements (Kaplan, 1984).

I demarcated these inter-category relevancies with string (dark lines in Figure 5), linking individual codes directly to the headings of any alternative categories that I perceived the codes as being relevant to. These strings were reminders of which codes I needed to consider from outside each category, when later interpreting the topics that I perceived to be emerging from each category. I also delineated some code-to-code links (within and across category boundaries; pink string triangles in Figure 5) that offered me similar reminders as I interpreted the data.

After this, I refined each category, summarising the ideas that constituted and defined each one. I used coloured felt-tip dots (marked onto the sticky-notes), to define the strongest code-to-code links within each category. Because the categories were constructed through the initial clustering of correlated codes, these strong code-to-code links occurred within individual categories. However, when considering each code, I was informed by the strings attached to it, affording it contextualisation, as described above.

Again, this process was non-linear, requiring iteration; repeated reflection and reconfiguration of the network; and continual reference to the original context of the codes, to pursue the grounded ambition of my analysis. This convoluted path was inevitable, given the complexity of the data⁵⁴; the grounded approach that I was taking to coding and conceptual organisation (as opposed to applying a pre-existing, pre-selected analytical framework); and my developing understanding of both the data and the theory that I ultimately applied.

Nevertheless, spatially plotting and linking the sticky-notes in this way enabled me to visually depict the conceptual relations that I developed thus far through the coding processes (Maxwell & Chmiel, 2014). I found that having the ideas laid out in such a visual and palpable way was helpful to, and affirmative of, my developing understandings of the data.

The next step was ‘emergent coding’. In theory, emergent coding involves integrating the small, descriptive, fragmented data points defined during open coding back into meaningful topical categories, based on the understandings of the researcher (Tracy, 2013). Reflection back to the research aim underpins this process and such interpretation enables insight, topical connections, and later, themes to be systematically synthesised from the coded data (Srivastava & Hopwood, 2009).

54. The data was complex primarily in that it arose from interviews with 25 experts with distinct conceptualisations, disciplinary training, and professional and personal experiences, who perceived and responded to my interview questions and ambitions through these respective lenses. Thus, interpreting and integrating the experts’ diverse responses was continually challenging.

Table 6: Interim outcomes of the analysis process. This shows five interim categories identified from the sticky-note network and interim topics that describe the data within each category.⁵⁵

Interim categories	Interim topics identified during initial data analysis
1. SOCIETY & THE FUTURE	• What people in Western cities value, and seek in their lifestyles. • Perpetuation of the unsustainable status quo. • Need and capacity for societal change. • Potential forms of change (e.g. intentional, gradual, radical, enforced, demographic, generational, technological, or catastrophic).
2. GREENING	• The value of nature in cities: ◦ for individuals (i.e. for biopsychosocial benefits); and ◦ for local/global ecosystem function.
3. CITIES AS PHYSICAL PLACES	• Contextualisation of cities within local bioregions/ecologies. • Effects of cities' physical design (e.g. form/layout) and function (e.g. infrastructures) on: ◦ city dwellers; and ◦ global ecologies (i.e. ecological economics).
4. INCLUSIVITY & SHARING	• Engaging more city dwellers in sustainability solutions. • Sharing ideas and solutions: ◦ among city dwellers; ◦ across disciplines; and ◦ between experts and city dwellers. • Improving equality of resource distribution.
5. PERCEPTIONS & MESSAGES	• Rethinking perceptions of what is 'normal' including: ◦ city dwellers' routine everyday practices; and ◦ institutional disciplinary silos. • Changing the publicised messages about socio-ecological issues and ways of life to include more digestible, acceptable, practical/achievable, and positive alternatives. • Offering visions of sustainable futures.

⁵⁵. These interim outcomes informed further analysis; they are not final results.

During this stage, I summarised the entire network of codes into a few specific topics per category, and these are listed in Table 6. These individual topics were revealed through the interviews as being particularly important to sustainability in future Western cities. However, further formulation of these interim topics was required to construct them into themes that could be situated within topical literatures and framed theoretically.

5.5 METHOD OF THEMATISING

Thematising was the next step of my data analysis (Tracy, 2013). The object of thematising is to clarify and frame the most salient issues from the data with reference to the research aim. While coding unravels the data, generating and organising a diverse array of concepts (e.g. my codes, and the topics shown in Table 6), thematising weaves these back into a cohesive whole (Tracy, 2013). This section covers my early processes of thematising, including use of a data matrix for cross-checking and a few dead end approaches; my eventual application and development of ecological habitus as a lens for thematising; and explanation of how my final themes (in the form of backcasted pathways) were derived from the data.

5.5.1 Early thematising and use of matrix for cross-checking data

My early thematising involved many false starts. Initially, I devised a series of loose analysis outlines (example in Appendix 11). The purpose of these was to organise the interim topics listed above into engaging themes of relevance to my research question. I refined these over time, reorganising the different topics within different themes. As I developed my habitus based analyses, these outlines were eventually superseded, as discussed below.

In these early stages of thematising I also returned to the transcripts to create a summary matrix (Appendix 12) plotting each expert's response to each interview question. This provides the most concise, but superficial response to the question (which I am most commonly asked about my research, by interested strangers): "What did the experts say?" This process followed after the grounded analysis, allowing my primary coding of the interviews to focus on the experts' insights vis-à-vis my research aim. As discussed above, the ten interview questions were designed primarily to elicit discussion and generate insightful material, rather than to achieve any standardisation of response. My ambition was to 'mine' expert insight, rather than respond to the specific interview questions or compare experts to one another. Thus, I did not need the matrix for comparative or other quantitative analyses. This approach is appropriate for qualitative exploratory research of this kind, where the objective is to pursue data of relevance to the research question, rather than to compare different participants' responses with one another (Kvale, 1996).

Furthermore, while summarising the responses to each question, the matrix does not provide a complete or weighted summary of each interview, or an accurate depiction of where each question led the interview dialogue. Significantly, it does not provide space for the discussions that deviated from the questions or insights that arose between or across questions and/or interviews. For example, the ‘grey areas’ of expert insight (where professional knowledge and personal experience come together to form emergent insight and foresight), which often occurred organically, between questions. Additionally, because the experts did not “submit tamely to a series of prepared questions” (Gillham, 2005, p.54), their responses did not align faithfully with the interview questions. Therefore, the matrix of responses was populated in part by my own perceptions of which interview excerpt constituted an answer to a given question, sometimes garnered from responses to other questions.

Nevertheless, the matrix proved valuable in tying-up loose ends. This resulted in an effective consolidation of the question-response data, and a reference point for reviewing these as I proceeded with thematising. For example, a summary of responses to Question 1 clearly showed that most experts didn’t situate themselves within the four domains of knowledge that I used to organise the information from my initial literature review, and Question 7 revealed that both top-down and bottom-up approaches were seen as crucial to creating socio-ecological change for cities (see Appendix 12).

5.5.2 Thematising with an ecological habitus framework

Ultimately, my thematising was framed with ecological habitus, organising the interim topics listed in Table 6 into three major themes, which were structured as backcasted pathways, and constitute my final interview results. This, combined with the theory development in Chapter 6, responds to Objective 3, developing a methodological and theoretical framework for analysing the interdisciplinary interview data, and framing pragmatic pathways towards future sustainability using this framework.

My intention was that these pathways would together provide a well-rounded response to my overarching research aim. In the final stages of my analysis, I was thematising the data and adapting ecological habitus theory as a framework simultaneously, and these processes reciprocally informed one another. This chapter focuses on the data processing involved, while the theory and framework development are discussed in the next chapter. A simplified diagram of the complete process is shown in Figure 6, below.

As I was thematising I was exploring the ecological habitus literature as one potential avenue for framing my data analysis. This concept was one that I had encountered before the interviews and sought to pursue by interviewing some ecological habitus scholars. However, at this stage I did not conceive of it as a framework unto itself that might be applied to my analysis.

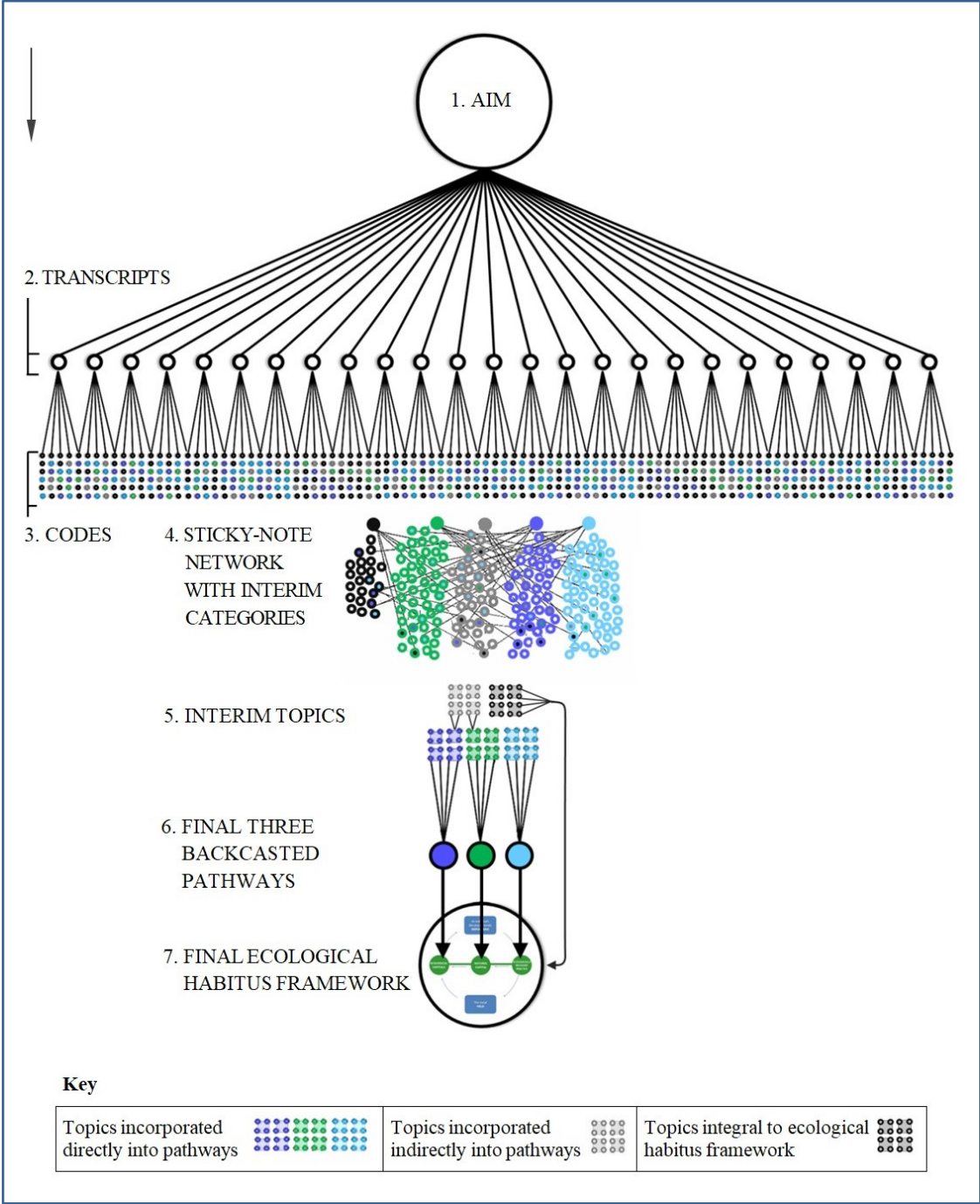


Figure 6: Chronological diagram of analysis. From top to bottom (arrow indicates direction of process) ⁵⁶: (1.) The research aim directed (2.) the 25 expert interview transcripts. Transcripts were analysed to delineate many codes (3.), which were then mapped as (4.) a sticky-note network containing five interim categories. From this, key interim topics (5.) were identified. During thematising, interim topics were variously included (see Key) into the final research outcomes, which were the three final backcasted pathways (6.) and the final ecological habitus framework (7.)⁵⁷. All analysis portrayed in this diagram is elaborated upon in-text.

⁵⁶. In this figure, analysis is simplified, stylised, and not to scale.

⁵⁷. The ecological habitus framework is explained in Chapter 6.

Nevertheless, the more that I read into this theory during my analysis, the stronger ecological habitus became as a contending analytical framework. Glaser and Strauss, the founders of grounded theory, confirm that most frameworks, ideas, and theories that arise from the grounded research process entail researcher's use of "substantive theories" (i.e. pre-existing, established scholarly theories) to strategically link their data to their "formal theory" (i.e. researcher-constructed theory, model, or in my case, framework) and that this is both desirable and usually necessary (Glaser & Strauss, 1967, p.79).

This stimulus from the literature, they claim, offers initial direction when it comes to developing categories from the data and properties of the theory/framework, as well as informing the integration of the data into the framework (Glaser & Strauss, 1967).

This was the case for me with my ecological habitus framework. Bourdieu's detailed theory of habitus (reviewed in Chapter 2) provided me with robust conceptual categories within which many inherent facets of my data could fit (e.g. capitals, practices, habitus, dispositions, reflexivity, etc.). Developing my understanding of Bourdieu and a comprehensive reading of ecological habitus scholarship enabled me to adapt this emerging theory, in line with my research aim, to effectively organise and frame my data.

This substantive theoretical basis (i.e. ecological habitus) was arrived at in a grounded way. Although I was aware of the concept before the interviews, I did not see it as being of any greater significance to my research than any of the myriad other theories of which the different experts were proponents and which I had reviewed in the literature previously (examples given below). Indeed, it was relatively less appealing to me because of my unfamiliarity with anthropology/sociology.

However, ecological habitus was selected for a number of reasons. Following my original reviews of literature where the concept arose as a way to conceptualise the practicalities of socio-ecological relationships, it was elaborated upon and reinforced to me as being a valuable and relevant research tool during several of the interviews. Following up on many different ideas raised in the interviews, including this one, I investigated and assessed Bourdieu's work and further ecological habitus literature (and eventually gained a supervisor with expertise in the theory). I found that habitus had the capacity to describe social reproduction and change, reflexivity, and the role of everyday practice, and therefore could frame key features of my interviews.

This selection rationale was comparatively grounded. According to Glaser and Strauss (1967), most researchers rely instead upon familiarity with theory and substantive literatures from their accustomed disciplines as platforms for grounded research (Glaser & Strauss, 1967). Alternatively, the researcher's agenda and expectations may decide this, with reference to norms (or funding) of their research community (Christiansen, 2011). The reflexive methodology that I endeavoured to undertake instead attempts to explore how language, assumptions, realities and worldviews are

interlinked, including within the researcher's internal world, and the alternative worldviews that are represented in the research findings (May & Perry, 2011). Further commentary on this reflexive process is provided in Appendix 3. According to Hibbert, et al. (2010, p.55) such critical reflexivity is a “necessarily messy” and “unsettling” process, whereby “insidious” assumptions and interlinked interpretations are “unravel[led] and disconnect[ed]”, and “thoughts and experiences are questioned and made more complex through the inputs of others”. The “doubt and contradiction” that this entails is “clearly distinct from the routine of systematic confirmatory reflexive modes” such as repetition of the familiar or incremental extension of well-known frameworks of thought and action (Hibbert, et al., 2010, p.55). So while ecological habitus was a rational choice for framing the data with integrity, it was not an intellectually doxic option.

Framing my research with an existing theory (e.g. one of many urban-ecology theories) would have been a less challenging approach to take. However, this would not have accurately represented the emphasis that the experts put on social reproduction, change, normativity, routinised practice, and critical reflexivity, which are the strengths of Bourdieu's theory. Similarly, other theories of multilevel sustainability-transition, such as Geels' (2002) framework for technological change, have previously been applied in sustainability backcasting research (Neuvonen, et al., 2014; further detail in Appendix 2); however, Geels' theory focuses on niche technologies rather than routinised everyday practice, and techno-economic market forces and innovations rather than sociological forms of change, making it a less appropriate choice. Further examples include Xiang (2016) and Morita (2010) who describe ‘ecophronesis’ and ‘ecological reflexivity’, respectively as models for describing how ecologically sustainable practice in individuals can contribute incrementally to more ecological ethics, and Xiang in particular proposes ‘ecophronesis’ as a problem-solving methodology. Eventually I adopted features of these theories into my conceptualisations of ecological habitus. However, on their own, they did not account for socially structured capital barriers to change or the way that ecological ethics and practices are reproduced in society. I was also influenced by various experts' theories (e.g. Beatley, 2011; Kellert, 2003; Leman-Stefanovic, 2012; Louv, 2011; Perlman & Hopkins, 1997; Register, 2002), as well as the many resources that they directed me to, and these are accordingly cited in the manuscripts of Part II.

Ultimately, ecological habitus was the most appropriate theory that I had encountered for responding to my research question and representing what the expert interview data was “telling me” with integrity, which is the priority of qualitative research (Srivastava & Hopwood, 2009), albeit requiring me to learn, adopt, and adapt to what was an entirely new theoretical platform for me. Undoubtedly there are other theories that could have insightfully informed my data analysis, and I make no claim to exhaustive searching. However, having spent three years full-time researching the topic to this point, on top of relatively interdisciplinary undergraduate studies, interviews with 25 experts, and surveys of material that they directed me to, it was evident that this theory could provide the heuristic necessary to process and present my data, proffering many benefits to this end.

Applying and later developing ecological habitus as an analytical framework happened in stages. At first I constructed a basic cyclic model to represent the fundamentals of habitus (Figure 2, p.26), re-interpreting the interim topics listed above through this Bourdieuan-inspired lens, with constant reference to the sticky-notes, quotes, and other data. This involved asking questions of the data such as:

- What are the perceivable social fields involved?
- What are the dispositions involved and what are the origins of these?
- What are the capitals involved and who commands these?
- Who are the agents involved?
- What are the practices that contribute to reproducing the status quo?
- What are the practices that have potential, or are seen already to create change?

This provided me with a set of well established Bourdieuan-analysis starting points, but I found Bourdieu's habitus model to be deficient when it came to framing ecological and natural capitals, and ecological reflexivity (ER). In the next chapter, I argue that these are critical to conceptualising *ecological* habitus and document my development upon habitus and ecological habitus scholarship and models to create my own framework, which integrates these factors. As my theorising developed, I formalised the need for further questions such as:

- What is the net effect of different forms of ecological habitus on natural capital?
- Where is reflexivity routinised and subconscious and where is it being intentionally and critically applied?
- How can critical ER (critER) be promoted?
- Where in the cycle of ecological habitus can change most pragmatically begin?

This process of questioning essentially entailed my own deployment of critER (i.e. evolving critical analysis of ecological habitus and its constituent interactive factors) as a methodological tool. This is what Kasper (2009a) proposed ecological habitus be developed into, and is equivalent to the way that Bourdieu applied reflexivity of habitus as a methodological tool in his own work. In Chapter 5, I discuss the role of ER as part of my ecological habitus framework, and in Chapter 6, I go into more detail about scholarly history and my own theorising around this nascent methodology as well as discussing the potential value that I foresee it could bring to socio-ecological research.

Through this process I re-assessed all of the interim topics that came from my data and either set a place for them as part of one of my final themes (i.e. pathways), or included them in my final results in other ways. Below I explain this process, clearly tracing how the interim topics shown in Table 6 (above) were linked into my ecological habitus framework to generate my final research results.

Table 7: Three major backcasted pathways to sustainability and the interim topics incorporated directly into these.

Sustainable city aspiration	Barrier to sustainability and practical solution	Interim topics included
1. City authorities as ecologically reflexive sustainability leaders	Barrier- Disciplinary silos inhibiting conscious/critical ecological reflexivity Solution- Promotion of interdisciplinarity and ecological imagination	• Sharing ideas and solutions: ◦ across disciplines; and ◦ between experts and city dwellers. • Rethinking perceptions of what is ‘normal’ regarding institutional disciplinary silos. • Offering visions of sustainable futures.
2. Enhancing everyday experiences of natural capital in cities	Barrier- Need for greater human-nature connection in cities Solution- Enrichment of cities with greater quality and quantities of nature	• The value of nature in cities: ◦ to individuals (i.e. for biopsychosocial benefits); and ◦ at a local/global scale (e.g. effects on local/global ecosystem function). • Contextualisation of cities within local bioregions/ecologies. • Improving equality of resource distribution (proximity, quality and quantity of natural capital particularly).
3. Small ecological actions towards mainstream sustainability in cities	Barrier- Sustainable ecological habitus being outside of mainstream society Solution- Identifying and enacting accessible ways for people to practice sustainability	• Engaging more city dwellers in sustainability solutions. • Sharing ideas and solutions among city dwellers. • Rethinking perceptions of what is ‘normal’ including city dwellers’ routine everyday practices. • Changing the publicised messages about socio-ecological issues and ways of life to include more digestible, acceptable, practical/achievable, and positive effective visions of potential alternatives. • Offering visions of sustainable futures.

5.5.3 Final thematising: from descriptive interim topics to backcasted pathways

As noted above, thematising is the final phase of analysis that weaves an array of data concepts back into a cohesive set of final research outcomes. During this process, aligning the interim topics from Table 6 with my ecological habitus framework helped me to identify how different topics could contribute towards the pragmatic creation of sustainable ecological habitus in Western cities, as per my research aim. This section clarifies the results of this process, explaining how each of the interim topics was ultimately integrated into the final research outcomes (i.e. as shown by points 5. to 7. in Figure 6).

a) Interim topics that were directly incorporated into the final pathways

The majority of the interim topics from Table 6 (further above) were incorporated directly into one of the three final backcasted pathways as shown in Table 7, above. Each of these pathways were conceptualised and constructed through the lens of my ecological habitus framework with emphasis on identifying pragmatic starting points (discussed in Chapter 6). Each pathway represented a way to ‘circuit break’ the perpetuation of unsustainable ecological habitus in Western cities, towards the pragmatic creation of sustainable alternatives (in ways drawn from my interview analysis), and consisted of the following backcasting components:

- An **aspiration** for change that would strategically improve sustainability in Western cities (and potentially beyond);
- A key **barrier** or sticking-point that prevents such change from being realised or becoming widespread; and
- Everyday **solutions** (i.e. **actioned change**) that people in Western cities could pragmatically begin with, to overcome these barriers.

b) Interim topics that were indirectly incorporated into the final pathways

Additionally, as my thematising progressed, some interim topics from Table 6 became less of a focus or were incorporated into the pathways indirectly. These were:

- Potential forms of change
In line with my research aim, options for relevant, intentional, and pragmatic forms of change were incorporated into the three final backcasted pathways, while unintentional, uncontrollable, or unworkable modes of change were not pursued in depth (see examples of each in Appendix 13).

- The effects of cities' physical design (e.g. form/layout) and function (e.g. infrastructures)⁵⁸ on city dwellers and global ecologies; and
- Improving resource equality

Both of these topics are critical to sustainability in Western cities; however, the interview data showed that pragmatic everyday change would be less able to address these directly. However, they are both things that authoritative individuals and city institutions (e.g. local government, city-planners, or urban-designers) have the power to change (e.g. through planning, regulation, taxes, development incentives, zoning laws, and/or housing, waste, transport, and energy infrastructures etc.; discussed in Chapter 8). Additionally, green infrastructure (i.e. natural capital and ecosystem services) intersects both topics, and equality of natural capital is featured in Chapter 9. Furthermore, developing ecological democracy and sustainability-participation in a broader spectrum of people could empower more city dwellers to engage with top-down approaches, participate in nature enrichment and otherwise effect change (Chapter 10).

c) **Interim topics that were integral to the ecological habitus framework**

Finally, as my ecological habitus theorising developed, three of the interim topics from Table 6 were recognisable as intrinsic parts of an ecological habitus framework. These were therefore incorporated into the ecological habitus framework directly as follows:

- What people in Western cities value, and seek in their lifestyles.

This can be conceptualised as people's pursuit of capitals, recognition, and doxa within the social milieu, and how dispositions inform practices to this end.

- Perpetuation of the unsustainable status quo

This is analogous to the way that ecological habitus is reciprocally reproduced by individuals and the social milieu in an ongoing cycle.

- Need and capacity for societal change

The capacity for change is inherent to modern conceptualisations of habitus. Recognizing the need for socio-ecological change at a societal level can be described as a conscious/critical variant of ecological reflexivity.

58. Cities' physical design and infrastructures have various effects upon city dwellers' abilities to practice sustainability (and their impacts on global ecologies). For example, municipal infrastructures can better enable recycling, composting (i.e. at industrial-scales), and reduction in carbon footprints (e.g. through public transport, walking, or cycling), while lack of these can inhibit such activities. Cities' form and layout can also influence sustainability. For example, dense cities with mixed land-use and proximity of residential areas to workplaces, schools, and other amenities (e.g. shops, libraries, and parks) can incline people to walk or cycle, while sprawling alternatives can have the opposite effect, particularly for children and the elderly.

5.6 VERIFICATION OF INTERVIEW ANALYSIS OUTCOMES

Another ongoing part of my analysis was verification. Verification in grounded research entails evaluating how well the hypothesis, model, or concept that the researcher has developed accounts for the patterns that emerge from the data and concerns of research participants (Glaser, 1978, as cited in Hallberg, 2010). It does not seek to verify outcomes based on experimentation, probability, or hypothesis testing, as do deductive approaches. Thus, I sought primarily to review how well the outcomes that I had arrived at reflected the discussions from the expert interviews. To do this, I returned to the raw interview transcripts and the matrix that summarised the experts' responses question-by-question (Appendix 12) during the final phases of the coding to cross-check for any major discrepancies, exceptions, or contradictions to the conceptualisations that I had formed, and to search for any overlooked insight with relevance to my aim (Kvale, 1996).

The matrix was valuable in this cross-checking process, especially to review responses about the societal levels where change might effectively begin, options for intervention and overcoming barriers, and examples of solutions (i.e. interview questions 7-10). These provided a useful summary against which to cross-check my grounded analysis. Where relevant I have included information from the matrix in my reporting of results (e.g. the number of experts who promoted top-down approaches) to portray the magnitude of response to a given question. However, the results are shaped to a greater degree by each expert's own focus, my perceptions of what was valuable to the research aim, and the ecological habitus based analysis.

Once I had drafted my ecological habitus framework during the final thematising phases, I repeated the verification process again to determine whether this emerging theoretical framing illuminated anything else important. Looking at Figure 6, this was equivalent to taking the ecological habitus framework (point 7), and returning to each transcript, code, sticky note, interim category and topic, final theme/pathway (points 2-6), and in some cases the raw interview recordings, to conceptually test whether the framework provided a holistic conceptualisation of the interview data of relevance to my aim.

The purpose of this verification was to enhance the rigour of the ecological habitus framework, the three pathways, and the study overall, revealing promising avenues for further investigation or adjustments that needed to be made to my final outcomes. The process was largely affirmative. I found that all of the ideas that were emphasised by the experts had a conceptual place within the ecological habitus framework that I ultimately developed (adjustments I made to achieve this are discussed in Chapter 6). I also found that the key ideas about creating sustainability in Western cities through pragmatic, everyday practice were covered collectively by the three pathways.

One form of cross-checking that I did not have the resources to apply was to have another person (or persons) review the interviews, transcripts, and analysis outcomes directly, in light of my research

aim. This would likely have revealed alternative interpretations; indeed, a defining feature of interpretive analyses of this type is the plurality of interpretations that are possible (Kvale, 1996), as discussed in Appendix 3. Nevertheless, my own analysis resulted in an abundance and richness of relevant material.

5.6.1 Topical literature reviews within grounded theory and constructive futures research

Another, later part of my thematising and verification process was to review the topical literatures that corresponded with the pragmatic pathway concepts that I was developing. When to review the topical literature during the research process is a contention of grounded theory methodology, with some scholars misreading Glaser and Strauss' (1967) directives and avoiding engagement with the literature altogether (Suddaby, 2006). It is contended by many that topical literature should be consulted (with ongoing reflexivity in all cases) once themes have been established (and to varying degrees before this). The value of such post hoc topical literature reviews is to:

- Sensitise the researcher to the parameters of existing topical literature (Lempert, 2010) including how the literature might better inform one's theory (Christiansen, 2011; Hallberg, 2010);
- Provoke novel insight (Giles, et al., 2013) including how one's theory might better inform the literature (Christiansen, 2011); and
- Provide "peer validation" of findings (i.e. triangulate findings in one's data with regards to existing scholarship) if desirable and/or appropriate (Kvale & Brinkmann, 2009, p.255).

Furthermore, in future-orientated research (see Chapter 3 & Appendix 2), informed creation of normative future visions is the primary aim, and these should be viewed within the "context of discovery" (i.e. assessed as jumping off points for further research or application), rather than the "context of justification" (i.e. attempting to validate probabilities in the tradition of quantitative forecasting, or validate theories as empirical research seeks to do; Dreborg, 1996, p.1). Therefore, these ongoing literature reviews were valuable in that they enabled me to enrich the backcasted pathways that I was developing from the interviews with reference to additional fields of topical literature, and identify compatible research arenas within which my emergent theories and pathways could potentially be applied, tested, or developed in the future.

For me, this ongoing topical review process included some overlap with my primary literature review as well as including new literature with specific relevance to the interview outcomes. The nature of my research meant that multiple spheres of literature had to be drawn into this process, including concepts that informed my theory development such as habitus (from sociology literatures); ecological habitus (environmental sociology, education, etc.); ecological reflexivity (a

new idea to me that is referenced across several disciplines); and natural capital (from ecological economics). The diversity of topical literatures involved in my backcasted pathways furthermore included interdisciplinary discussions on leadership; institutional and disciplinary silos (which were new concepts to me); interdisciplinarity itself; collaboration; biophilia; bioregionalism; nearby nature and the extinction of experience (two new concepts); ecological literacy, democracy, and identity (parts of these were new to me); environmental psychology; and environmental behaviour change.

Inevitably (given the broad scope of my research) this involved learning about ideas that were raised in the interviews, but which I had not previously encountered in the literature. One of the challenges of grounded and interdisciplinary methodologies is the need for such ongoing literature reviews that reach into quite diverse fields of research. I found the conceptualisation, synthesis, critique and comparison of these literatures (against each other, and against my data, interpretation, and developing theory) was a highly critically reflexive process, necessitating cognitive flexibility and evolution. Nevertheless, undertaking these reviews meant that, despite the unexpected twists and turns that the interviews and analysis took, I ended up with relevant, robust, and up-to-date scholarly understandings that I could draw upon to enrich my conceptualisations and discussion, and to critically situate my research.

Accordingly, the topical reviews herein are appropriately directed by and organised around the experts' topical agendas (Christiansen, 2011), and in accordance with my aim (Hallberg, 2010). They highlight and background themes derived from the interviews, and portray complex concepts through broad sampling frames, in an 'integrated literature review approach'; this synthesises relevant topics transversely according to the themes of the research, rather than providing a compendium of literature on individual topics (Kohtaka, 2015, cited in Hugé, et al., 2016). These reviews, including all of the literatures noted above, are provided in the respective thematic manuscripts (Chapters 7-10).

5.7 ORGANISATION OF FINAL RESEARCH OUTCOMES WITHIN PART II OF THE THESIS

The final outcomes of this research are the ecological habitus framework and the three backcasted pathways, and these are contained in Part II of the thesis. Because these outcomes were developed in parallel during the analysis, they are correspondingly interwoven in the forthcoming discussions. However, I discuss my theoretical framework first (Figure 7), as this includes ideas that are used in the subsequent topical chapters.

- Chapter 6 discusses theory development, specifically: Ecological habitus as an aspiration, descriptor, and framework
- Chapter 7 discusses theory development, specifically: Ecological reflexivity as a socio-ecological research tool (structured as a manuscript)

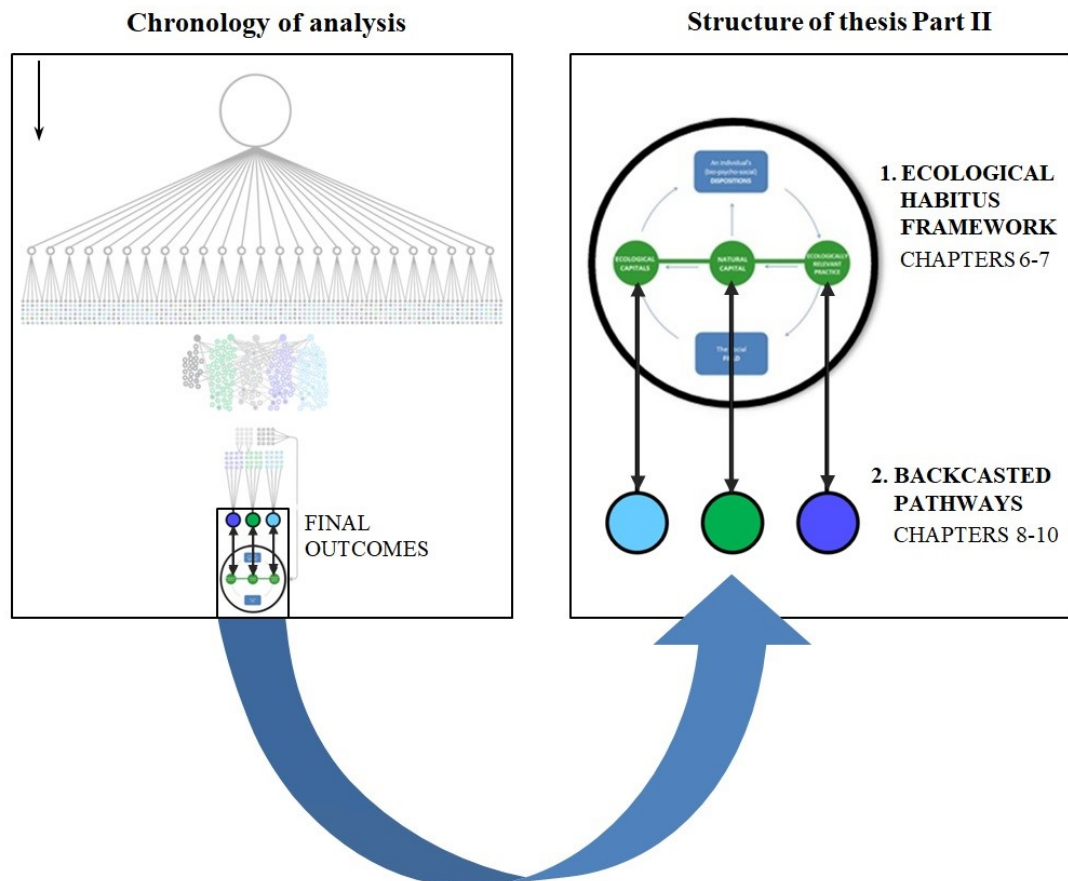


Figure 7: Simplified diagram showing chronology of analysis (left) and how this translates into the structure and presentation order of thesis Part II (right) – double ended arrows show links between theory and topical themes.

Then, Chapters 8-10 (structured as manuscripts) discuss three pragmatic pathways to sustainability, respectively. A concise summary of these is provided in Appendix 14 to provide the reader with an overview from the outset if desired. Significantly, the three pathways are complementary and could technically be arranged in any order. Each is discussed with reference to the ecological habitus framework, as depicted by the linking arrows in Figure 7. Within this thesis, I present them in the following sequence, which I perceive will enable the reader to progressively understand my conceptualisations of ecological habitus in cities and all the different theoretical and topical factors involved:

- Chapter 8 covers a backcasted pathway focusing on: Sustainable city leadership amidst disciplinary silos
- Chapter 9 covers a backcasted pathway focusing on: Enriching cities and everyday life with natural capital
- Chapter 10 covers a backcasted pathway focusing on: Small ecological actions towards mainstream sustainability in cities

5.8 CONCLUSIONS

This chapter provided an overview of my data analysis process. The main struggle throughout this process was to manage the volume and diversity of interdisciplinary data that came from the interviews. Referring to Objective 3, the primary goal of this phase was to develop a framework for data analysis, as well as framing the pragmatic pathways towards sustainability that arose from these. This framework needed the capacity to distil and compact the data to the point of being conceptually and practically workable, while incorporating a great diversity of concepts from within the data, and synthesising these into a cohesive whole.

The first step of the analysis was grounded coding and creation of the sticky-note network to pinpoint key ideas from the interviews and organise these into categories. I then engaged various loose analysis outlines as part of early thematising, before settling on ecological habitus as a theoretical platform, and developing this into an analytical framework to structure the final research outcomes (in the form of pragmatic pathways towards sustainability in Western cities). Developing and applying this conceptual ecological habitus framework, which provided a comprehensive, transposable, and flexible way to integrate and distil the data according to my aim, responded to Objective 3 of my research, and was one of the most significant achievements of my research. This is also the focus of the next chapter.

The methodological developments and opportunities for reflexivity (imposed and intentional) that occurred during my data analysis were also milestones in my research. The iterative, exploratory, reflective, and creative elements required of my mixed-methods interviewing and analysis approach were a steep learning curve for me, requiring methodological review, and reflexive and innovative evolution of my method in response to barriers and opportunities that came from the process. Developing, applying, revising, and eventually superseding each approach in turn (conceptual map of the four domains, sticky-note network, loose analysis outlines, iterations of the ecological habitus framework, etc.) necessitated reflexivity, flexibility, and adaptive innovation that is not required from the conventional, established, or otherwise ‘taken for granted’ methods that I had experienced pre-PhD in the natural sciences. Even strongly structured or well established methods in the social sciences that I have become familiarised with (e.g. the traditional Delphi method; see Appendix 2) have their own inbuilt protocols and systems of validation that do not necessitate such

methodological innovation. Each step in my research method was a development unto itself as well as eventually becoming a departure point, in an ongoing and exploratory process.

Neither did I anticipate the intensity or duration of the analysis. In what Kvale describes as the “final phase of exhaustion” (1996, p.86), towards the end of writing up my complete first draft, I began to reflect upon the exertion required to conduct, transcribe, manually code, and repeatedly analyse the volume of material that came from the interviews. The hundreds of pages of transcripts that resulted demonstrate the intensity of qualitative research methods, specifically when conducting exploratory research and studying experts (whose interviews are dense and rich with insight). Future studies approaches such as the Delphi method, and backcasting, as well as expert interviewing are all portrayed in the literature as efforts requiring a research team (Dreborg, 1996; Varho & Huutoniemi, 2014), and I felt acutely aware of this throughout the years that I dedicated to these processes.

Nevertheless, the benefits of independently conducting each phase of the research did create consistency to my approach and cohesion of contextual understanding throughout the research process. Furthermore, working with the different experts, reading widely of the topical literatures, receiving feedback from my diverse supervisors, and being immersed in the research data enabled me to internalise some of the concepts and insights, and develop my understandings and capacities for working across disciplinary silos. Furthermore, this combination of experiences facilitated critical reflexivity of my own conceptualisations, disciplinary socialisations, socio-ecological understandings, concepts around social change, etc., and encouraged me to develop the notion of critER as a potential methodological tool for future research.

As noted above, development of the ecological habitus framework for conceptualising and assessing sustainability and potentially diagnosing points of strategic and pragmatic change was one of the most significant outcomes of my research. The framework conceptually supported my development of key pragmatic pathways towards sustainability in Western cities based on the interview data. In the next chapter, I focus on documenting how this theoretical framework evolved from existing conceptualisations of ecological habitus and as a response to my data analysis, and what the framework looks like in its final form.

Look at the world around you. It may seem like an immovable, implacable place. It is not. With the slightest push – in just the right place – it can be tipped.

—Malcolm Gladwell, *The Tipping Point*

PART II: RESEARCH OUTCOMES

The chapters presented in Part II contribute to Objective 3 of this research, describing the framework that I developed to analyse and theoretically frame the interview results, and Objective 4, pinpointing pragmatic changes that individuals within Western cities could undertake to contribute strategically to ecological sustainability, with reference to this framework.

First, Chapter 6 discusses how I drew on the interview results and existing literature to develop ecological habitus theory, creating a framework to analyse and conceptualise my interview data.

Chapter 7 adds to this theoretical discussion, presenting my conceptualisation of ecological reflexivity, and discussing how this could contribute to a paradigm shift in the societies of Western cities towards better recognition of (i) humanity's interdependence with the natural environment, and (ii) the ways that societal change could enhance ecological sustainability. This chapter is structured as a manuscript, and incorporates interview results to develop upon the theoretical literature.

Chapters 8-10 focus respectively on each of the three pragmatic pathways towards sustainable ecological habitus in Western cities that resulted from my data analysis. Each discusses an aspiration for the future, a key barrier to realising this, and a strategic and practical pathway towards overcoming this barrier. These chapters are structured as manuscripts and are relatively self-contained. Each chapter and pathway is of equal importance and they contain complementary (rather than sequential) ideas. They are presented in this order because I view that it will assist with progressive understanding of both my theory and the topical concepts involved.

Chapter 6

ECOLOGICAL HABITUS AS AN ASPIRATION, DESCRIPTOR, AND FRAMEWORK

6.1 INTRODUCTION

This chapter outlines my application and development of ecological habitus theory within this thesis. New theoretical conceptualisations and developments are sought-after in sustainability research, especially future-orientated research for sustainable cities (Ratcliffe, et al., 2006; Williams, 2010), and such conceptualisation are also an ongoing focus in emerging literature around ecological habitus (Kasper, 2009a), reflexivity (Hibbert, et al., 2010), and backcasting (Ilstedt & Wangel, 2014; Robinson, 1988). This chapter describes the three ways that I apply ecological habitus herein and how these relate to and develop upon existing ecological habitus scholarship, with some reference to its Bourdieuan origins (see Chapter 2). In brief, my three uses of ecological habitus are:

1. As an aspirational goal, which I term ‘**sustainable ecological habitus**’. This is the normative concept as applied by Haluza-DeLay, and is analogous to Karol and Gale’s ‘habitus of sustainability’ (see 2.5.2 & 2.5.3).
2. As a tool for conceptualising or describing socio-ecological relations (whether ecologically sustainable or unsustainable). This is denoted ‘**ecological habitus**’ herein, and follows the value-neutral definition advocated by Kasper (see 2.5.4).
3. As an ‘**ecological habitus framework**’ for conceptualising, assessing, and/or informing change to socio-ecological relationships. This application unites the previous two, enabling examination of status quos *and* framing of aspirational change towards ever-greater sustainability. It also incorporates the concepts of natural and ecological capitals and ecological reflexivity (ER) in newly developed ways, building on Kasper and Gäbler’s proposals (see 2.5.5). This is the major theoretical development of this thesis.

In this chapter, I discuss the first two points briefly, then the majority of the chapter is dedicated to describing the third point, how I developed ecological habitus as a framework. The final framework is presented towards the end of the chapter, and responds to thesis Objective 3. The

framework both emerged from and informed the concluding stages of my data analysis, and frames the discussions in the following chapters.

6.2 ASPIRATIONAL ‘SUSTAINABLE ECOLOGICAL HABITUS’

The most well-developed use of ecological habitus in the literature is Haluza-DeLay’s work on environmental organisations (see Chapter 2), including his piece entitled “*The practice of environmentalism: Creating ecological habitus*” (Haluza-DeLay, 2006b). The focus on routine practice in this piece is what initially attracted my attention to his use of the theory. My research sought to identify pragmatic pathways to advance sustainability in cities, and a focus on pragmatic, materially situated, socially plausible, everyday action⁵⁹-based, and practical solutions is central to this aim. Haluza-DeLay painted ecological habitus as one such holistic theory, encompassing social and ecological contextualisation into one broad concept, while being firmly and pragmatically situated within everyday life, and specific material/ecological ‘places’.

The first way that I adopted ecological habitus within my research was in accordance to this use (and that of Smith, 2001), as a way to describe the aspirational, ecologically sustainable way of life that I wanted my research to contribute towards. I demarcated this aspirational goal as ‘sustainable ecological habitus’, to distinguish it unambiguously. The phrase is able to describe two things. Firstly, it defines the ‘sustainable’ *kind* of ecological habitus that is being aspired to. ‘Sustainable ecological habitus’ involves a relationship between people and other ecologies that can be ‘sustained’ in perpetuity, involving the maintenance (or ideally regeneration) of natural capital at a local and ultimately global scale. In contrast, ‘ecological habitus’ (as per Haluza-DeLay’s use) is more ambiguous, as it could equally describe unsustainable socio-ecological relationships. Secondly, my definition describes *what* is being sustained (i.e. ecologies of natural capital). This contrasts with the ambiguity seen in Karol and Gale’s “habitus of ‘sustainability’”, which is intended to be conceptually analogous, but could equally describe ‘sustaining’ social harmony, or ‘sustaining’ economic growth, for example. For my research, I define sustainable ecological habitus as a scenario where humanity’s drawdown on global natural capital is scaled back to a magnitude that Earth’s ecosystem services can compensate for, and recover from. It describes a total ecological footprint for humanity that occupies no more than one Earth (and aspirationally even less).

For Western cities to contribute to this aspiration, many changes to everyday city life are needed. However, rather than aiming for a fixed endpoint, change towards sustainable ecological habitus is

59. I differentiate ‘actions’ as a fine-grained scale of activity within everyday routines, which can be intentional innovations or even accidents; actions are what people ‘do’ in the most objective sense. I use ‘practice’, in contrast, to describe socially- and psychologically-tethered processes that are part of habitus, whereby ‘actions’ are embodied into individual’s dispositions from social fields and are enacted within fields through capitals, etc.

a process and a direction to begin moving along, and this is the focus of my thesis. The beginning of my thesis title, ‘How then *could* we live?’ arose in an early meeting between my original supervisor and myself while planning my doctoral proposal. We were discussing the unsustainable trajectory of humanity as it stands, and how people *could* live instead. We analogised, in our discussion, veering off the beaten (unsustainable) ‘track’, to create an alternative, metaphorical ‘high road’ (or roads), that are more ecologically sustainable.

This thesis is not fixated on what might be at the ‘end’ of various roads (e.g. romanticised or apocalyptic forecasts), and is only partly about what the sustainable ‘roads’ might look like once established. This thesis is primarily about how people in cities of today could *begin* to veer off the beaten track of unsustainability along new, more sustainable ‘roads’ that go in slightly different (but not too uncomfortable or unfamiliar) directions at the outset. It is about how barriers to progress along these roads can be strategically circumvented, and how ultimately this could lead to an altogether different future trajectory.

From the interviews, I gathered many insights about what desirable future change could look like (and indeed, changes that have already begun), what barriers there are to creating the broader change that is still needed, and an array of prospective everyday solutions, which could be initiated in the present, to begin overcoming these barriers. What ‘sustainable ecological habitus’ provides in my research is a way to envisage this dynamic, framed by established concepts of social and dispositional reproduction and change, structuring and enactment of capitals, reflexivity, routine practice, and intentional change. It enables the conceptualisation, which I sought from the beginning, of how a change in direction could begin and what day-to-day ways of living could first set this in motion.

Haluza-DeLay, within his work on environmental organisations, portrayed many ways that this divergence from the unsustainable status quo could occur and be maintained over time, illustrating his findings from lived examples within environmental social organisations and permaculture groups and drawing on his previous work with urban youth (Haluza-DeLay, 2006a, 2006b, 2008; Haluza-DeLay & Berezan, 2013). The modes of change he focuses on are providing people with opportunities to routinise various ecologically sound practices, social support of these practices and ideals, and fostering an ecologically-orientated strain of reflexivity (discussed further below). Kasper’s (2008) work on eco-villages describes similar ways that such sustainable ecological habitus can be supported, and she places even greater emphasis on the material conditions involved, such as people’s sources of food and water, for example.

This existing research exemplifies how ‘ecological habitus’ can be applied to conceptualise positive examples of people’s existing ecological sustainability, including the fields, capitals, dispositions and practices involved. They furthermore portray how sustainable ecological habitus

is and could be created and supported within existing social fields. However, much of the existing ecological habitus literature pertains to examples from incubatory social fields where people involved are predisposed to sustainable ecological habitus (e.g. Carfagna, et al., 2014; Haluza-DeLay, 2006b; Haluza-DeLay & Berezan, 2013; Kasper, 2008). In contrast, to apply ecological habitus to contemporary Western cities, where sustainable dispositions are not necessarily the norm (see 1.1), and the mainstream of people are comparatively less receptive, inclined, or able to create and practice sustainable ecological habitus, I needed a different approach. Moreover, if sustainable ecological habitus is to supersede the existing unsustainable status quo, any such approach must engage with a diversity of issues and potentialities that make up life in Western cities. This is where the expert interviews came in, offering me an interdisciplinary range of strategic options for creating change as well as many recognised (but underexploited) practical solutions with which to begin. As discussed in previous chapters, to interpret and frame this array of ideas I turned to ecological habitus as a theoretical framework to anchor my research. This time, I began with Kasper's conceptualisations of ecological habitus.

6.3 'ECOLOGICAL HABITUS' AS A NEUTRAL DESCRIPTOR AND LENS

I reserve the phrase 'ecological habitus' herein to describe a value-neutral 'lens', as proposed by Kasper (see Chapter 2). A key difference between Kasper and Haluza-DeLay's works is that Kasper's value-neutral 'ecological habitus' can describe socio-ecological relations whether ecologically "supportive" or "antagonistic" (Kasper, 2009a, p.320). This is more in keeping with Bourdieu's own positivistic use of habitus. Bourdieu intended his concept of habitus to be applied methodologically to illuminate the full complexity and spectrum of human social life:

...The core of my work lies in the method and a way of thinking. To be more precise, my method is a manner of asking questions rather than just ideas. This, I think is a critical point (Bourdieu, 1985, quoted in Harker, et al., 1990, p.33).

Kasper (2009a) proposed that ecological habitus be applied in a similar way, as a lens through which to conceptualise the generative entanglement of human social life with natural ecosystems, providing researchers with a way of thinking and formulating questions about these phenomena. As Kasper (2009a) aptly points out, this lens could be applied equally to describing ecologically sustainable or unsustainable/antagonistic socio-ecological relations.

Although I differentiate Kasper and Haluza-DeLay's work by the positivity/normativity of their use of ecological habitus, both scholars are harmonious in their intention to research the advancement of ecological sustainability. The value highlighted to me by Kasper's proposed

application of ecological habitus was that it can illuminate the unsustainable status quo in Western cities as another form of ecological habitus, in addition to aspirational, sustainable forms. Thus, ecological habitus as a neutral lens enables conceptualisation of the full spectrum of existing and potential socio-ecological relationships that my research aims to bridge.

Another valued contribution of Kasper's propositions for ecological habitus was her visual model of what ecological habitus actually entails day-to-day and how this could be assessed in comparative ways across different fields and individual (Figure 8).

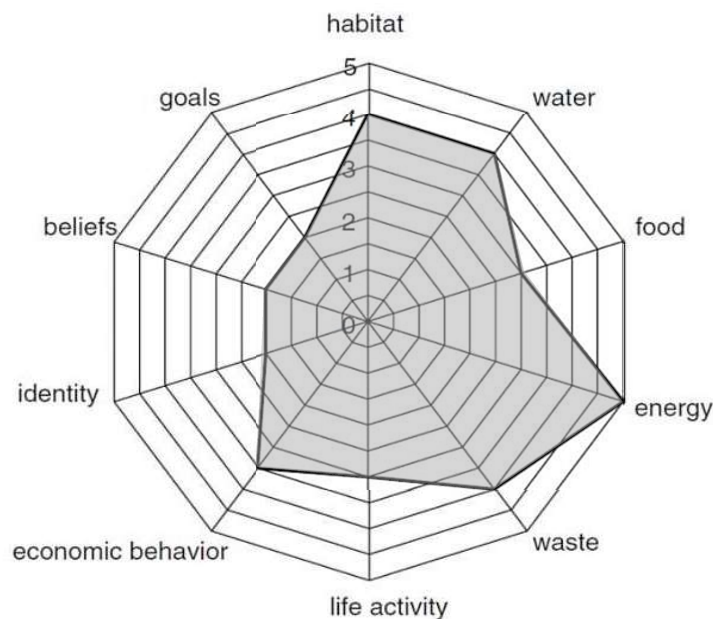


Figure 8: Kasper's model of ecological habitus, with example. Adapted from Kasper (2009a), and showing nine proposed 'dimensions' of ecological habitus and their relative environmental impact on a scale of 0 (no impact) to 5 (maximum negative impact). The degree of impact for each dimension is indicated by the darker black line, and shaded area within this outline is representative of the total impact of the exemplified ecological habitus. The model does not account for positive impacts (e.g. replenishment of resources) but could be adapted to do so.

I found Kasper's visual model to depict ecological habitus in ways that words alone cannot. Kasper proposed that a given ecological habitus (e.g. within a case study) can be conceptualised (and/or assessed) as a series of relevant dimensions (water, food, energy, waste, etc.). These dimensions are depicted as the axes of the model and each can be assessed on its degree of ecological sustainability (e.g. resource use or replenishment, and ecosystem harm or enrichment). Collectively this enables mapping of an individual's ecological habitus. This is a similar idea to modelling different dimensions of a person or group's 'ecological footprint'. This contributed to

my conceptualisations of how the Western city status quo and an alternative, more sustainable ecological habitus could be modelled⁶⁰, and what creating such change might entail.

The main limitation of Kasper's model for my purposes was that it does not depict all the Bourdieuan elements that constitute ecological habitus (i.e. dispositions, capitals, field, and practice). Instead, it focuses on the ecological impacts of a person's various *practices*, and thus does not represent the role of social mediation, reproduction, or the potential for change in ecological habitus. Revision of this could enable Kasper's model to depict both the unsustainable ecological habitus of contemporary cities (as a large ecological footprint) and alternative, sustainable ecological habitus. Such stasis and change is a focus of my research and comprised a large portion of the interview data that I sought to analyse and frame through a theoretical lens of ecological habitus. Thus, I sought further ways to develop and model the concept, with this in mind.

6.4 DEVELOPING ECOLOGICAL HABITUS AS A FRAMEWORK

Consequently, the third and ultimate application of ecological habitus in this thesis is as a framework for assessing existing (often unsustainable) ecological habitus and seeking to create strategic and pragmatic change towards alternative, more sustainable ecological habitus variants. I constructed the framework iteratively throughout the course of my research. In particular, building on Bourdieu's own work and previous scholarship on ecological habitus (outlined in Chapter 2), I developed and applied the theory to analyse the interviews and frame my research results.

As discussed in Chapter 2, contemporary conceptualisations of Western habitus highlight how it is frequently and even routinely reflexive and intentionally changed. Existing literature on *ecological* habitus also gravitates towards this idea of change. In particular, Kasper and Gäbler's recent works (see Chapter 2) call explicitly for ecological habitus to be engaged in research on creating socio-ecological change. Despite this, a comprehensive framework for applying ecological habitus for this purpose does not exist, and creating such a framework became core to my research.

As previously discussed, iterative methods are “deeply reflexive” (Srivastava & Hopwood, 2009, p.77), allowing more sophisticated understandings that emerge from later stages of research to be perceived within later cycles of data conceptualisation (Scott, 2004; Srivastava & Hopwood, 2009), and cohesively woven into the reported research results (Luker, 2008). Within my research, this meant that I did not finalise or frame my results until I was confident that my theoretical framework could robustly represent them through a lens of ecological habitus. Equally, the

60. Chapter 10 elaborates on this thread of Kasper's theory, depicting how dimensions of sustainable ecological habitus might be adopted within the mainstream of city people.

framework was informed by my repeated consideration of the results and evolved in response to each wave of fresh insight that my data analysis provided.

Bourdieu included such an approach within his own epistemology. As Swartz (1997) describes, Bourdieu proposed a research approach that follows a ‘logical order’, where different strands of the research (e.g. theory and data analysis) are traced through the research process in parallel to one another, rather than following a ‘chronological order’, that is executed in a sequential series of discrete steps⁶¹, where:

Theory calls forth and is rooted in data; data and their organization and verification embody theory (Swartz, 1997, p.35).

Applying and developing my ecological habitus framework and analysing my data in parallel assisted me in conceptually organising the data more easily and effectively (with regards to my research aim). This also enabled me to identify holes in these theoretical conceptualisations as they pertained to the topic of my research, and devise this novel model that elaborates on habitus, and more effectively represents the dynamics between ecological habitus, ER, natural capital, and ecological capital.

Sayer (2005) describes how such constructive critique and elaboration of Bourdieu’s work enables it to “do new work” (Sayer, 2005, p.23). In this case, my model for ecological habitus enables Bourdieu’s theory to do ‘new work’ assessing socio-ecological issues, the barriers to changing them, and the possibilities of overcoming these barriers in Western cities of the 21st century. In doing so, it provided me with the framework for conceptualising change that I sought to respond to thesis Objectives 3 & 4.

Developing and applying the framework outlined below allowed me to conceptualise the interview data in terms of ecological habitus and its components. It can portray the reasons why unsustainable ecological habitus in Western cities is reproduced, enables placement of the specific social and individual barriers to creating socio-ecological change, and correspondingly enables identification of everyday practices for overcoming these. Thus, it can portray key ideas from my data.

61. My process was a recursive ‘spiralling’ rather than a linear chronology as discussed in 5.3. Because of this, there is not a definitive order for reporting my methodology and theory development. I present them in separate ‘method’ and ‘theory’ chapters to provide as logical a sequence as possible for the reader.

6.4.1 Modelling cyclical change in habitus

The following sections explain how this framework evolved through my research process. I began by returning to Bourdieu's formula, which is by far his most simplified depiction of what shapes practice: "[(Habitus) (Capital)] + Field = Practice" (1979, p.101). Evidently, changing the terms on the left-hand side of the equation (habitus [i.e. dispositions], capital, or field) leads to consequent changes to practice. It is perhaps less clear that, like a true mathematical equation, changing the terms on either side leads to an overall rebalancing. Thus, in life, changes to practice (especially collective practice) can create change in the field, capitals, and dispositions. Rather than being a passive outcome of circumstance, as the equation may suggest at first glance, practice is an active component.

Indeed, practice is *the* most active component of the habitus dynamic, providing the most accessible point for reflecting and changing habitus (Giddens, 1991; Sweetman, 2003). For example, a routinely *practiced* action (e.g. learning or experiencing) can, over time, provide an individual with additional capital. Similarly, change in field and dispositions are dependent on what people do, requiring some form of action to begin with, and usually the routinised *practice* of such action over time.

This is where the mathematical symbolism of the formula ends, for all of the factors of habitus have effects on one another. Furthermore, the process is not linear or predictable. Habitus has only relative and temporary points of balance (i.e. *doxa*), and does not have a beginning or an end (births and deaths are the closest it comes to these). Thus, I considered that adopting a cyclic representation of habitus seemed a logical and more accurate way (than the formula) of portraying how habitus is reproduced or changed over time through dispositions, capitals, fields, and practices (Figure 9).

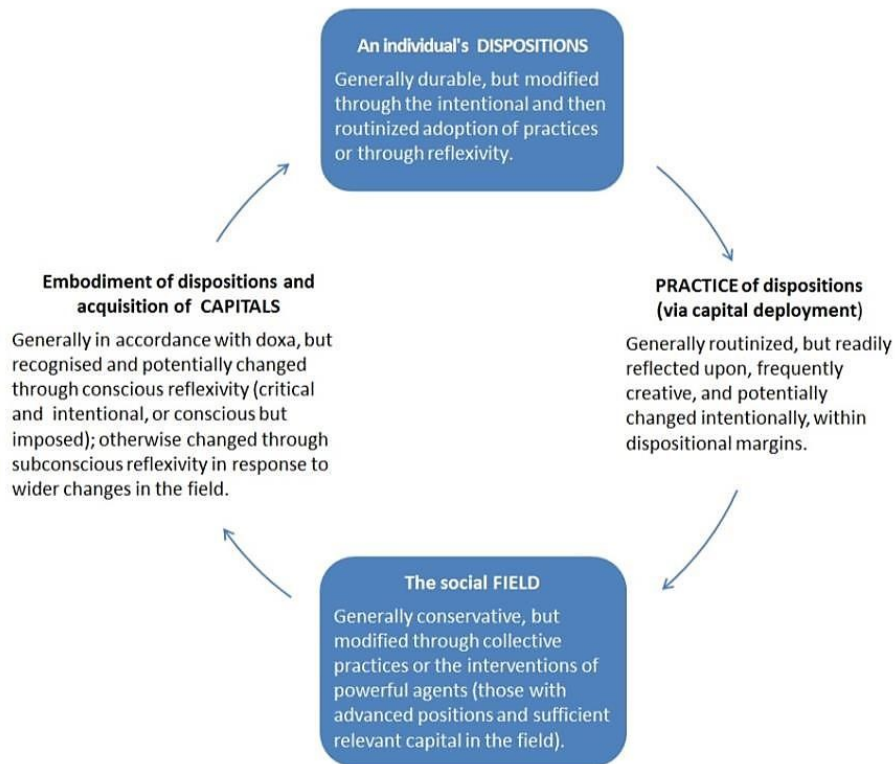


Figure 9: Cyclic model of habitus depicting the potential for reproduction and change in each element. Arrows indicate the predominant ways that each component influences the next (e.g. changes to practice always occur in social fields, collectively shaping fields; social fields always structure human capitals; capitals always contribute to individuals' dispositional 'realms of possibility'; and practice is structured by dispositions. The arrows also 'flow-through' each factor to the others (e.g. changes to practice, happening in social fields, flow through to effect capitals, dispositions, etc.).

In Figure 9, I present a cyclic model of Bourdieu's 'habitus' that I developed, which is (surprisingly to me) the first cyclic model that I have come across where each element feeds into overall habitus in a cyclic fashion. Following a clockwise direction from the top, this model depicts how a person's dispositions are enacted through practice within social fields and how capitals and dispositions are embodied by individuals from the social field. This model portrays how each factor clearly has flow-on effects (whether conservative or progressive) to all others.

The text in Figure 9 furthermore describes how habitus and its components are generally reproduced (or changed). Dispositions are generally durable, practice is generally routinised, the social field is generally conservative, and the embodiment of the social field and acquisition of capitals usually occurs in accordance to doxa, and through subconscious reflexivity (mediating each individual's habitus in accordance to their field). However, as discussed with reference to reflexivity (see 2.2.3 & 2.3), contemporary habitus is increasingly likely to entail change, both intentional and imposed. Because changing any element of habitus can affect the others, each element offers possibilities for 'circuit breaking' an extant (ecologically unsustainable) habitus. A

circuit breaker can be intentional or unintentional. However, for my purposes I focus on those that begin with intentional change. Thus, a circuit breaker involves change to one (or multiple) elements of habitus (e.g. change in practice and/or growth of capital), which interrupts the cyclic reproduction of existing habitus. Such amendments flow through the cycle to create changes in other elements of habitus (e.g. the field and individual dispositions). In this way, habitus as a whole is changed (by however small a degree). Some of these possible circuit breakers for change are exemplified in the text of Figure 9.

In the ecological habitus literature (both conceptual and empirical) the focus has been on how change can occur (and has) to create and support sustainable ecological habitus. This includes circuit breaking the cycle by providing supportive social environments (Haluza-DeLay, 2008), propagating ecologically relevant capitals, particularly in childhood education (Karol & Gale, 2004), and through embodied practice (Cooke, et al., 2016; Gäbler, 2015). Furthermore, intervening at the level of social fields can create imposed and pervasive change to individual habitus and its constituent components. Such intentional change might be undertaken by powerful agents (i.e. those with advanced positions in the field and sufficient field-relevant capital) or influential individuals (e.g. the pedagogues in Karol and Gale's 2004 example), or through collective changes to practice. Each of these modalities can be superimposed onto the habitus cycle in Figure 9.

While elements of habitus, and the way they change, can be more readily conceptualised by focusing on one element of habitus, the reality is that all elements pervade all others, and any change has flow-on effects. For example, Haluza-DeLay focuses primarily on the way that environmental organisations support sustainable ecological habitus by providing supportive social fields. However, he notes that they simultaneously provide opportunities for capital acquisition in the form of social capital (e.g. meeting compatible people) and cultural capital (e.g. learning opportunities), as well as through practical experience. His work also demonstrates how ecologically sound practices can foster changes (conscious and then routinised) in an individual's dispositions.

Thus, singular fields, dispositions, capitals, practices, and reflexivities can be targeted as points for creating change in the cycle. However, a more comprehensive/holistic approach that recognises the cyclic and interrelated relationship between these components, and addresses them simultaneously, is more likely to create effective and durable change. The literature generally agrees that the first step to developing such a strategy is to understand the extant habitus in question and its components, and then to devise a coordinated strategy for creating comprehensive change (Haluza-DeLay, 2008; Kasper, 2009a; Smith, 2001; Swartz, 2002).

This necessitates being consciously/critically reflexive of current habitus. Both Haluza-DeLay (2006a) and Smith (2001) frame an individual's habitus as having two components: the practical understandings, or 'lifestyle' components, and the conscious/critically-reflexive, cognitive components that equate to an awareness of the dynamics shown in Figure 9. Conscious reflexivity is not labelled in the Figure, but is equivalent to an understanding of each element, the relationship between them, and the dynamics of Figure 9 as a whole. While subconscious reflexivity is critical for the reproduction of habitus (enabling the elements of the cycle to affect one another recursively and maintain doxa) it is conscious/critical reflexivity that accompanies more radical, rapid, or intentional change to habitus. As discussed previously, this is an increasingly common phenomenon. Conscious reflexivity can be imposed by changes in the accustomed field or one's position in the field (e.g. job loss); shifting to a foreign field (even temporarily); or internalising facets of a field (e.g. activism) where reflexivity is prevalent (Crossley, 2003; Haluza-DeLay, 2008; see Chapter 2). Alternatively, conscious, and particularly critical, reflexivity might be intentionally cultivated⁶², and again is equivalent to having a (variously comprehensive) conscious awareness and questioning of the factors in the habitus cycle (e.g. the conservative reproduction of social norms, the structures inherent to social fields, and the way these structures and various capitals mediate practice).

The more comprehensive one's understandings of what habitus and its elements are, the more scope there is for conscious/critical reflexivity. In turn, such awareness can reveal potential circuit breakers for change within habitus. Obviously, having such 'sociological imagination'⁶³ and capacity for reflexivity does not necessitate knowledge of Bourdieu, classification of habitus, capitals, field, and practices, or comprehensive consideration of entire lifestyles. For example, a person can be reflexive about a single practice they undertake, and intentionally change that practice, without any broader contextualisation being necessary. However, Bourdieu's well-developed theory does offer a comprehensive means of conceptualising these elements and a language to describe them and their cyclic relationship, which, as he intended, is valuable for research into social change and reproduction.

Consequently, I propose that the habitus cycle presented in Figure 9 offers a tool of particular value to socio-ecological change research, for facilitating reflexivity to assess any habitus and its components, and for identifying potential leverage points (Meadows, 1999) by which to change these.

When applying this cycle as a tool for conceptualising *ecological* habitus, it is necessary to apply an additional 'ecological lens' (see Chapter 2), focusing on the more ecologically salient factors of

62. Of course, awareness and understanding of habitus and the ability to be critically reflexive are in themselves forms of capital. This is an example of the circular and inextricable interrelations between the various components of habitus.

63. Mills (1959) applied 'sociological imagination' to describe one's ability to imagine the relationship between an individual and wider society.

habitus. This was the first approach I took when applying ecological habitus to analysing my interview data. This provided a framework for conceptualising the data and identifying which factors in the contemporary habitus of Western cities are involved in reproducing unsustainable status quos, and where change in the cycle could potentially be created.

6.4.2 Applying the cyclic model of habitus during data analysis

I applied the cyclic model of habitus (Figure 9) with added consideration of the socio-ecological dimensions of Western city life (i.e. an added lens of ecological imagination⁶⁴) during the second round of interview analysis. The first round was a grounded analysis, applied to draw out the key insights, and scale-down the quantity of the data. In the second round, the cyclic model offered a way to conceptualise and categorise the different experts' responses under the umbrella of ecological habitus. These analyses and their application respond to my 3rd Objective: to develop a methodological and theoretical framework for analysing the interdisciplinary interview data and framing pragmatic pathways towards future sustainability. This was an iterative and protracted process, as discussed in Chapter 4.

Viewing the interview data with reflexivity of the habitus cycle was very valuable to my analysis. Through this lens, I was better able to conceptualise the existing, pervasively unsustainable ecological habitus in Western cities and identify the factors involved in its reproduction. The cyclic model furthermore provided me with a way to identify some specific barriers to creating change in extant habitus, and I discuss these further below.

I found from this analysis that there is plentiful scope to create change in extant city habitus, even within the mainstream of Western city dwellers. The experts gave many examples of where this is already occurring. Rather than offering a comfortable, doxic way of life, contemporary city lifestyles were seen by the experts to generate dissatisfaction at times, leading to what Sweetman (2003) describes as 'dis-ease' - and increasing disease. Combined with climatic, technological, demographic, and political changes, and their pervasive effects on many social fields, the experts perceived change as inevitable and often desirable within Western cities. Furthermore, without considerable change towards ecological sustainability, they described the increasing likelihood of ecological (and correspondingly economic) catastrophe, which would impose wholesale change on a global scale.

64. 'Ecological imagination' is conscious reflection upon the specific/personal and abstract/global ways that people influence the natural environment (natural capitals and ecological systems/processes), and how this reciprocally influences people (Thomashow, 1996).

6.4.3 Adding natural capital as a tenet of ecological habitus

This brings me to the major shortcoming of the cyclic model of habitus, which rendered it insufficient as a final framework for my research. A major difference between habitus (Figure 9) and ecological habitus is the need to conceptualise humanity's reliance upon 'natural capital' (i.e. all natural resources and the ecosystem services provided by the earth; see Costanza & Daly, 1992), which there is no set place for in Figure 9. Bourdieu's conceptualisation of habitus focuses on sociological reproduction and change, while ecological habitus emphasises the integration of biological (and correlated psychological) components of habitus (Pickel, 2005). These components (e.g. breathing, eating, and heating) are reliant upon natural capital (e.g. oxygen, food, fuel), in comparison to social phenomena such as language that can be conceptualised as parts of habitus without overt consideration of natural capital.

Natural capital therefore requires a place within an ecological habitus 'formula'. Without natural capital, there is no basis upon which to consider ecological habitus. In essence, any consideration of ecological habitus is anchored to the net effects that people have on natural capital and vice versa (albeit less commonly discussed). For example, *sustainable* ecological habitus describes a direct or indirect striving⁶⁵ to preserve or replenish natural capital and unsustainable ecological habitus achieves the opposite (whether intentional or not).

The biological foundation of habitus and people's corresponding reliance on natural capital may have been taken for granted in Bourdieu's time, but is becoming increasingly significant now as socio-ecological relationships become increasingly unsustainable. Greater consideration of this is therefore needed, particularly for anyone seeking to conceptualise ecological habitus.

Of particular focus here is the environmental unsustainability of cities that is increasingly threatening natural environments' capacities to provide for this biological foundation of habitus, and for humanity itself (i.e. natural capital such as clean air, water, and fertile soil). Addressing the balance of natural capital is an essential part of a sustainable future for cities and underpins the success of other forms of change. Thus, including natural capital as a key factor in ecological habitus is a critical part of my conceptualisations of the theory.

There are several other characteristics of natural capital that I consider to differentiate it from other capitals, meaning that it cannot be included as a group with the social, economic, cultural, and symbolic capitals in Bourdieu's work and the cyclic model (Figure 9). I outline these characteristics next, before presenting a revised model.

1. It is indispensable - Natural capital is fundamental to human survival (and all biota).
Without natural capital, all conceptualisations of ecological habitus are meaningless.

65. Because it is a collective capital, this striving equates to a communal contribution rather than an individual acquisition.

This elevates natural capital above concerns of culture or lifestyle, making it an indispensable foundation of every habitus. Every human seeks out natural capital in the form of breathable air and drinkable water, for example. This contrasts to the relatively arbitrary tastes and ambitions of habitus that have been the focus of recent history (material affluence, power etc.; see Karol & Gale, 2004).

2. It is natural and irreplaceable - Natural capital exists outside of/'beyond' the social milieu, but is not an externality. At the global scale, processes of purification; balanced enrichment; and circulation of the atmosphere, water, and soils, which are provided by ecosystems⁶⁶ cannot be reproduced by people or replaced with synthetic alternatives. Therefore, none of Bourdieu's capitals accurately represents natural capital or can stand in its place when considering ecological habitus.
3. It is communal and boundless - Natural capital is a broadly communal form of capital, the pursuit of which can benefit others on universal, intergenerational, and inter-species levels. For example, a tree planted today could outlive the planter, continue to produce oxygen for biota of the future, and potentially reproduce itself independently from any human intervention.
4. It is relatively self-sustaining and independent - Natural capital is persistent and ultimately independent from social fields (albeit suffering their day-to-day effects), when compared to other capitals. It reproduces itself, in contrast to cultural capitals such as oral histories, which are bound to human beings, their lifespans, and their sphere of social influence. Without routine human investment, cultural capitals can disappear across even one generation, while natural capital pre-dates people and routinely persists without their input.
5. It is dynamic and complex in ways we do not fully comprehend - All natural capital feeds into ecosystem processes, and the addition or subtraction of ecosystem components have flow-on effects to interrelated ecosystems at every scale. Many of the intricacies of these interconnected ecosystems, and their roles in supporting humanity are only beginning to be understood (e.g. Clemente, et al., 2012). This further demonstrates how natural capital transcends the limitations of cultural capital (i.e. human knowledge).

6.4.4 My proposed 'ecological habitus framework' for change

I further developed the cyclic habitus model (Figure 9, above) to represent these characteristics of natural capital, resulting in an additional model (Figure 10, below) that depicts all components of ecological habitus specifically, rather than relying on an imagined 'ecological lens' over a purely

66. This idea is central to strong sustainability and ecological economics, as discussed in Chapter 9.

Bourdieuian model. This model can be applied in the same way as those previous, but adds natural capital at its core and focuses more explicitly on reproduction and change in *ecological* habitus. Interpreted with an understanding of ecological habitus, this model represents my third and final application of ecological habitus in this thesis, as a framework for conceptualising change.

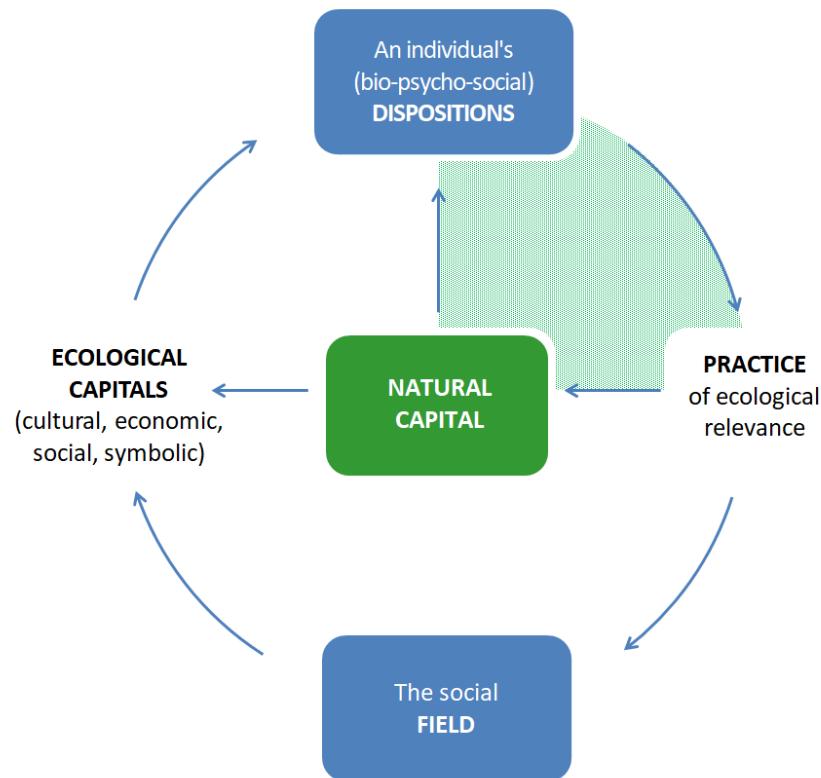


Figure 10: Cyclic model of ecological habitus depicting natural and ecological capitals. Arrows show predominant ways that change flows through the system (see caption of Figure 9 for more explanation, p. 131). The green shaded area delineates processes specific to ecological habitus whereby practice, natural capital, and dispositions influence one another most directly.

The major conceptual development represented by Figure 10 is that ‘**natural capital**’ is depicted as existing in a human-nature feedback-loop of its own (delineated by shading in the top right quadrant of the Figure). This feedback loop depicts how an individual’s biopsychosocial dispositions and ecologically relevant practices are directly linked to natural capital, representing how natural environments provide for the biology of human life. This includes the arrow linking natural capital (in the centre of Figure 10) to ‘**dispositions**’ (at the top) depicts how natural capital is embodied directly into an individual’s dispositions and body without mediation from the social milieu (e.g. via breathing). Natural capital can also influence dispositions directly when people ‘self-dispose’⁶⁷ ecological habitus, seeking communion with nature apart from their social field, to

67. This phrase is from Haluza-DeLay’s doctoral thesis (Haluza-DeLay, 2006a). I apply it to describe the ways that individuals reinforce their own ecologically sustainable dispositions, with relatively little enforcement from their social fields.

gain direct biological and psychological benefits. This idea is supported by research into psychology, where nature is found to be an emotive factor that informs people's reasoning and motivations (i.e. dispositional traits) in ways that complement 'rational' thought (Milton, 2002).

Individual dispositions, in turn, structure a person's ecologically relevant '**practices**' as depicted by the arrow linking these two factors in Figure 10. Practice is (of course) also influenced by other capitals, the social field, etc., by degrees, as these dimensions of habitus flow throughout the cycle in the normal way of habitus. However, by definition, practices are ecologically relevant when they have an influence (positive or negative) on natural capital. For example, in sustainable ecological habitus variants, a person's practices contribute to natural capital in net neutral or net positive ways. One way that a person might achieve such balance is to contribute directly to natural capital (e.g. planting trees). This practiced effect on natural capital completes the shaded human-nature cycle, represented by the arrow from 'practice' to 'natural capital'.

An additional arrow (to the left of Figure 10) and factor of ecological habitus, is the link between natural capital and '**ecological capitals**'. This represents how 'self-disposing' or a person's other interactions with natural capital can add to their own ecological capitals including ecologically salient practical skills (e.g. gardening), knowledge (e.g. from observing animal behaviour), and conscious/critical reflexivities. Ecological capitals are defined here as forms of Bourdieuan (primarily socially structured) capitals that have particular 'ecological salience'⁶⁸ (i.e. effect on/from natural capital). For example, solar panels could be considered an ecological (economic) capital, and energy-certification an ecological (symbolic) capital, because both are orientated towards achieving a net neutral or net positive effect on natural capital. Figure 10 furthermore depicts how ecological capitals feed into an individual's ecologically relevant dispositions. In contrast to the direct interactions with natural capital provided by breathing etc., this is an indirect way that natural capital influences people. In sustainable forms of ecological habitus, for example, a person could become disposed to contribute to natural capital indirectly by exercising their ecological capitals through practice (e.g. producing a film that encourages people to plant trees).

Aside from the shaded human-nature cycle, the remainder of the Figure 10 depicts the normal processes of Bourdieuan habitus whereby practices influence collective social fields; social fields mediate ecological capitals (e.g. through natural resource management, social norms, etc.); and the structuring, availability, inheritance, construction, embodiment, and other configurations of ecological capital influence each individual's ecologically relevant dispositions.

68. What constitutes 'ecological salience' is debatable and depends entirely on the lens being applied; the research question; the purpose of describing, assessing, interrogating, or changing ecological habitus; the type of ecological habitus in question (e.g. sustainable or otherwise), etc.

Thus, Figure 10 can be seen as the human-nature cycle (green shaded area) layered atop the traditional Bourdieuan habitus cycle⁶⁹, thereby depicting how natural and social milieus simultaneously constitute a person's ecological habitus. This model enables depiction of the direct effects of natural capital on people (i.e. direct embodiment), combined effects of natural capital and the social field on people (i.e. in the form of ecological capitals), people's effects on natural capital through their most ecologically relevant practices, and the overall incorporation of natural capital into the ecological habitus dynamic (i.e. as these embodied forms of natural capital, ecologically salient dispositions, capitals, and practices generatively and systemically flow through the ecological habitus cycle).

6.5 APPLYING THE ECOLOGICAL HABITUS FRAMEWORK WITHIN MY RESEARCH

There are two further concepts that I view as critical when applying this framework as a conceptual tool for understanding and promoting intentional change to ecological habitus in Western cities (as per my research aim). These are the role of everyday practice, and the concept of ER (ecological reflexivity). Applying the ecological habitus framework modelled in Figure 10 to my final analysis of the expert interviews (as described in Chapter 5) led to many final points of theoretical development, including these two, and enabled me to iteratively refine and ultimately define the three final backcasted pathways that I present as my results. I summarise the three pathways below to the degree required to complete my discussion of this theory development. The pathways themselves are elaborated upon in later chapters.

One pathway from the interviews (presented first herein⁷⁰) centred on disciplinary silos within leading city institutions (details in Chapter 8). Among city leaders, these barriers to understanding socio-ecological phenomena result in insufficient responses to sustainability issues when deploying powerful capitals (e.g. in education, research, urban-design, and economics). This has pervasive flow-on effects for habitus in cities as a whole, as these institutions are responsible for managing influential city systems. The experts' collective aspiration would be for such city authorities to practice 'critical ecological reflexivity' (critER⁷¹), whereby ecological habitus in and of institutions - and the effects that this has (social, ecological, economic, etc.) is routinely interrogated and constructively changed. This is one reason why I incorporate ER as a core concept in my ecological habitus theory. ER is outlined further below and discussed fully in Chapter 7.

69. As shown in Figure 9, further above.

70. Pathways are complementary and not ordered by importance.

71. CritER, I argue, is a skill and therefore a form of ecological capital in itself, which people can cultivate, possess, and deploy in practice to facilitate sustainable ecological habitus. It is therefore also a practice and can eventually become an embodied disposition (see Chapter 7).

The second pathway from the interviews centred on natural capital, which contributed to my theorising around this as discussed above. The experts' viewed that insufficient natural capital⁷² in cities prevents people from experiencing nature first-hand, lessening their capacity, awareness and/or inclination to value, protect, or replenish it (detailed in Chapter 9). This was seen to be diminishing the connection that people have with the natural environment, their dispositions toward it, and therefore the likelihood of sustainable ecological habitus. A lack of natural capital was also seen to reduce cities' capacities to function in ecologically sustainable ways. For example, without the absorbent capacity of tree roots, other plant cover, and unsealed earth, cities may have greater storm-water surges and flooding during heavy rainfall, requiring additional expenditure on hard infrastructure (e.g. pipes and pumps). Of course these infrastructures and technological 'fixes' also require environmental resources to manufacture. Supplementing Western cities with natural capital in pragmatic, everyday ways, the experts envisioned, would provide a solution, both directly (in that photosynthesisers, etc., enhance ecosystem services) and indirectly (in that access to greater natural capital can enhance sustainable ecological habitus in city dwelling people, as discussed in Chapter 9).

The third pathway from the interviews centred on the unreflective reproduction of unsustainable practice in the city mainstream, in accordance with 'normal' Western expectations of lifestyle. This was seen as a pervasive hurdle in the struggle for change towards ecological sustainability in Western cities (detailed in Chapter 10). However, the aspiration would be that those city dwellers who are not orientated to ecological sustainability and who may be oblivious, apathetic, repelled, or perceivably excluded from top-down and more radical 'green niche' (e.g. environmental activism) approaches, could begin to become engaged from within their respective social fields through everyday forms of education, practice, etc. This draws parallels to and develops upon Kasper's (2009a) description of ecological habitus and its various dimensions (see Figure 8). This pathway especially is broad in spectrum, and to pinpoint my focus and conceptual framing of the issues, I anchored my analysis to pragmatism and everyday practice, in line with my research title and aim.

6.5.1 My emphasis on pragmatism and practice

This section explains how pragmatism and practice play into my conceptualisations of ecological habitus, and how they informed my analysis, and how they link up with natural and ecological capitals. When applying the ecological habitus model for change (Figure 10) during my interview analysis (see Chapter 5), I focused especially on pragmatism and practice in accordance with my research aim. Everyday practices offer a highly pragmatic starting point for creating change (Brand & Wissen, 2012; Whitehead, 2009), and I sought, in particular, to identify practices that

72. 'Natural capital' includes non-manufactured things (e.g. trees, minerals, and ecosystems), and services/processes (e.g. oxygenated atmosphere and fresh-water cycling).

could circuit break the cycle of unsustainable ecological habitus in Western cities, and ignite change towards a more sustainable future.

Gäbler contends that a “threefold enterprise is necessary to better comprehend the [contemporary] ecological crisis”, encompassing habitus, field, and practical sense (Gäbler, 2015, p.83). I agree with this, but add that comprehending and successfully responding to this crisis requires explicit focus on *ecological* habitus and consideration of other Bourdieuan-inspired concepts that Gäbler does not discuss, namely natural capital, ecological capital, and particularly ER. Within this thesis, I address all of the above, focusing especially on everyday changes to people’s practices that could in turn contribute strategically towards much broader change.

I propose that practice, natural capital, and ecological capital (specifically the capacity for critER; discussed below) are the most pragmatic avenues for creating this change, for the following reasons:

1. **Practice** is the most readily reflected upon and easily changed aspect of habitus (Giddens, 1991; Sweetman, 2003) and offers a diverse spectrum of possibilities for creating everyday change.
2. Enhancing **natural capital** is the most direct and meaningful⁷³ way to contribute to ecological systems, strengthening the core of ecological habitus (as depicted in Figure 10).
3. Adding to **ecological capital** (e.g. ecologically salient knowledge, economics, skills, and other resources) can empower people to enact and grow their sustainable ecological dispositions through practice. In particular, critER is a potent form of ecological capital (that can be practiced and become dispositional), which enables people to assess their own ecological habitus and its effects on natural capital, and potentially inform how to change and improve this.

I therefore view practice, natural capital, and ecological capital as three potential nodes where ecological habitus can be changed. Together these three constitute what I call the ‘pragmatic backbone’ of ecological habitus, as shown in Figure 11, below. My research aims to find ways to strengthen this backbone, addressing change at each of the three nodes, in turn, and with a corresponding backcasted pathway based on the expert interviews.

73. This contrasts with greenwashing or weak-sustainability, which may contend to have ecological value, but does not materially enhance net stocks of natural capital.

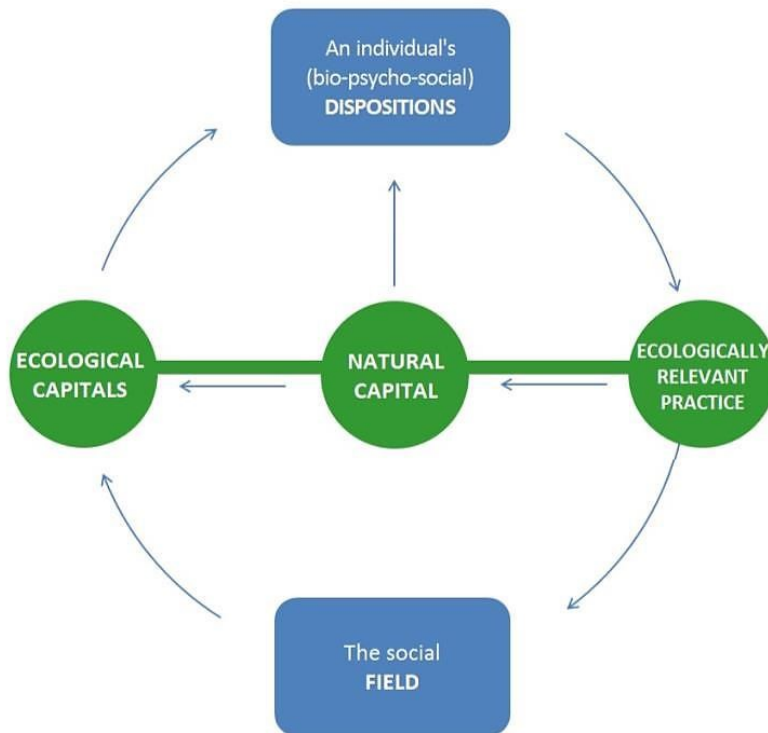


Figure 11: Cyclic model emphasising the pragmatic backbone for creating change in ecological habitus. Arrows show predominant ways that change flows through the system (see caption of Figure 9 for detail p. 131).

Change to ecological habitus can also come from (and be created within) dispositions and fields. However, these changes are less achievable on a pragmatic, everyday basis, and therefore are not the focus of my research. Changing the field could, for example, entail enforced change by powerful institutions or influential individuals. In my research, individuals with institutional authority were seen as the people who can instigate this kind of change, through their top-down control of many capitals within cities (see Chapter 7). In particular, economic change (towards equality) and changes to cities' physical design, organisation, and infrastructures (e.g. public transport and density/walkability) were highlighted by the experts as important factors. I do not address these topics directly herein as they cannot be addressed directly at a pragmatic everyday level, but I do incorporate consideration of them into my discussion of city authorities as potential sustainability leaders and discuss what everyday changes could pragmatically be undertaken at this level. Specifically, I suggest that imbuing such leaders with critER could promote greater ecological consideration within authorities' economic policy and city design, leading to high order/top-down change towards sustainable ecological habitus.

A field can also change through collective change across many individuals. Gäbler suggests that the total 'ecological field', might be enlarged by engaging new 'players' in sustainability or by empowering existing 'players' (especially those currently marginalised) with capitals. In Chapter

9, I discuss practical ways that this kind of empowered collective change can begin to take place. Engaging a body of city dwellers with small sustainable practices, I argue, could lead to change in ecological habitus across city fields as a whole.

Changing existing dispositions is another, more gradual process of change, which can be influenced by changes in capitals (particularly critER), practices, and natural capital, directly. However, changing the way that dispositions are first embodied offers another way that ecological dispositions can be fostered, beginning in childhood and persisting lifelong. Primarily this is the realm of environmental education, which is a topic unto itself and not the focus of this thesis (e.g. Fien, 1993; Karol & Gale, 2004; Kelly, 2006). Similar to my considerations of field change, I subsume the topic of early (and all) education into my discussion of critER development within city leaders, for these include educational professionals. In my research, the educators that I interviewed were mainly tertiary focused, but similar changes can equally inform other levels of education (e.g. Karol & Gale, 2004).

I also incorporate the idea that natural capital has an important place in affecting the emerging dispositions and ecological habitus of children. In Chapter 8, I discuss the ways that this occurs, and offer a series of practical ways that natural capital might be enriched within cities to encourage this effect. Furthermore, in Chapter 9, I discuss how introducing small practical changes into city dwellers' existing routines could effectively segue into lived ecological sustainability.

6.5.2 My use and development of ecological reflexivity

Ecological reflexivity is the final strand in my ecological habitus theory development. As discussed previously, Bourdieu used 'reflexivity' to describe the conscious and critical consideration of habitus (in all its complexity) that he applied as both concept and method in his own research (Wacquant, 1989). I accordingly define the conscious and critical consideration of ecological habitus as one type of 'ecological reflexivity', which I call critER, and apply in this research. However, as discussed (2.4, p.37), there are a spectrum of reflexivities that occur within habitus, and a spectrum of ER within ecological habitus; I outline the parallels between the two in Table 8, below. My development of ER in this thesis is detailed in Chapter 7, and this responds and adds to existing ecological habitus scholarship (Gäbler, 2015; Haluza-DeLay, 2008; Kasper, 2009a).

Table 8: Comparison of Bourdieuan habitus and reflexivity with my conceptualisation of ecological habitus and ecological reflexivity.

Type of habitus:		Bourdieuian habitus	Ecological habitus
Primarily involves relationship between:		Individual and social field.	Individual and natural capital (i.e. the natural environment).
This relationship can generally be conceptualised through:		Sociological imagination; environmental factors are not necessarily included.	Ecological imagination; social factors are not necessarily included.
In terms of habitus, this relationship can be conceptualised through:		Bourdieuian reflexivity	Ecological reflexivity (ER)
Examples of what different types of reflexivity/ecological reflexivity entail ← Scale of increasing awareness	Inherent, subconscious, and routine.	Adjustment of habitus in response to social field (e.g. ways of speaking, or walking).	Adjustment of ecological habitus in response to natural capital (e.g. mind relaxes when viewing natural landscapes, seeking shelter from a downpour, or moving through natural terrain such as sea swimming or forest hiking).
	Imposed or intentional, conscious, and periodic.	Relationship elevated to conscious level due to imposed social change (e.g. job loss) or by intention. Can involve corresponding imposed or intentional change to habitus.	Relationship elevated to conscious level by imposed change in natural capital (e.g. power-cut in storm, or water-shortage in drought) or by intention. Can involve corresponding imposed or intentional change to ecological habitus.
	Intentional, critical, and periodic.	Relationship elevated to conscious level and interrogated due to the individual's capital capacity for intentional criticality (e.g. in a social activist). Results in recursive, intentional change to habitus (e.g. buying fair-trade).	CritER: Relationship elevated to conscious level and interrogated via an individual's capital capacity for intentional criticality (e.g. in an environmental activist). Results in recursive, intentional change to ecological habitus (e.g. reducing use of fossil fuels or single-use plastic).*
Tool for facilitating critical reflexivity/ecological reflexivity:		Cyclic model of habitus (Figure 9).	Cyclic model of ecological habitus (Figure 10).
*The parallel use of 'ecological reflexivity' in anthropology/sociology (e.g. Manuel-Navarrete & Buzinde, 2010; Morita, 2010) generally refers to this critical strain of reflexivity, particularly that which results in intentional change towards ecological sustainability, but does so without reference to habitus or its components – see Chapter 7.			

My theory development also adds to literature on ‘ecological reflexivity’, which is discussed in anthropology/sociology to describe recognition of the interactive relationship between people and the “dynamic ecological whole” (Mellor, 2000, p.118). When applied intentionally as a way to reflect on ecologically relevant actions it is furthermore seen to precipitate environmental ‘identity’, and with it, more continual mindful/in-the-moment consideration of the human-nature dynamic (Morita, 2010). However, it has not previously been discussed comprehensively as a parallel to Bourdieu’s reflexivity (see Chapter 7 for full review).

Through the process of my research, my own capacity for intentional critER also developed. This occurred as my sociological (particularly Bourdieuan) and ecological knowledge grew, with reference to ways of life in Western cities, and my intentional practice of critER escalated (brief examples are offered in Appendix 1). In my interview analysis I also applied critER (framed by my model) to systematically consider the various factors of ecological habitus that the experts discussed in relation to Western cities (what were the capitals involved, what were the social fields involved, what practical everyday changes might be undertaken towards more sustainable alternatives, etc.). There is potential for similar applications of critER to contribute to future socio-ecological research and this is discussed in the next chapter.

6.6 CONCLUSIONS

This chapter discussed how incorporating natural and ecological capitals into ecological habitus theory and modelling strengthen it as a way of describing socio-ecological phenomena and correspondingly improve its value as a potential research tool. I found and developed ecological habitus to be a robust framework for conceptualising how pragmatic change towards sustainable ecological habitus might occur in Western cities at a broad scale, and the tangible and everyday actions that might contribute to this change. In this thesis I seek to demonstrate how the framework can be applied with critER to envision aspirational ‘sustainable ecological habitus’ and significantly, to analyse existing, unsustainable ecological habitus that is the status quo, and identify pragmatic ‘circuit breakers’ (e.g. latent potentials within social fields, capitals, dispositions, practices, and/or the interactions between these) within this that could be leveraged to create change, towards sustainable ecological habitus as the ‘new normal’ for Western cities. This theory permeated my research in every way as discussed in previous chapters.

My presentation of ecological habitus as a framework for conceptualising change builds on previous scholars’ research that considers ecological habitus in small-scale social settings and responds to proposals for its conceptual/methodological application. Like Bourdieu’s habitus, ecological habitus offers a transposable instrument that is generalizable to various fields of inquiry but can also be adapted to specifics of practice. It therefore has potential to be applied to any

number of other broad-scale socio-ecological research topics. Examples of this include case studies of specific cities or social fields, analysis of policy, or as a way to analyse/frame further interviews with various socio-ecologically relevant experts or city dwellers (e.g. from ‘green’ niches/movements, or from the urban mainstream). As Gäbler (2015) suggests, the framework might additionally be applied retrospectively to analyse incidences of large-scale socio-ecological change (e.g. adoption of municipal recycling or more recent plastic bag bans). Such analysis could reveal where in the habitus cycle change began, escalated, was most significant, and/or might readily be replicated. In Chapter 7, below, I review ER more thoroughly, and discuss its nuances, potential applications, and my own use and theoretical development of it within this research.

Chapter 7

ECOLOGICAL REFLEXIVITY AS A SOCIO-ECOLOGICAL RESEARCH TOOL

Abstract

Greater awareness of humanity's socio-ecological entanglement is called for across disciplines to spur innovation towards ecological sustainability. This idea was reflected in the 25 expert-interviews that I undertook to explore interdisciplinary perspectives on how to strategically and pragmatically contribute to more sustainable Western cities. 'Ecological reflexivity' (ER) has been tabled as a way to describe such socio-ecological awareness. However, exactly what ER involves, how to develop it, and how to engage it as a conceptual research tool are questions that remain to be explored. This manuscript aims to: (i) review existing ER literature and present Bourdieuan theory as a means of developing the concept; (ii) propose a logic of questioning to prompt ER and unpack ecological habitus; and (iii) illustrate the value of ER as a conceptual research tool, using examples from my interviews. I contend that ER can be informed by Bourdieuan reflexivity theory in the same way that ecological habitus has been developed upon Bourdieu's habitus, a theory of practice. I define ER as intentional-critical, conscious-periodic, and/or subconscious-routine-embodied reflection on the ecological habitus dynamic, including ecologically salient dispositions, capitals, practices, and social fields, and the reciprocal, recursive change that this can result in. Intentional and critical strains of ER (critER), I argue, can be cultivated and applied as a conceptual tool to help describe and understand the dynamics of existing ecological habitus (e.g. of a person, collective, or research narrative), critically evaluate the components of habitus as ecologically sustainable or otherwise, and frame potential starting points for improving sustainability through practical change. My elaboration of critER as a conceptual tool responds to calls in the literature for ecological habitus theory to be developed as a research methodology, and for means of conceptualising practical change in the pursuit of a more ecologically sustainable global future.

7.1 INTRODUCTION

In response to mounting global ecological crises (e.g. climate change, fresh water pollution, and mass extinction) alternative ways of life that preserve Earth's natural capital and life-giving capacities for present and future generations (i.e. 'strong sustainability') are widely called for

(Daly, 2005; Goodland & Daly, 1996; McKibben, 1989; Meadows, et al., 2004; Raskin, et al., 2002; Rockstrom, et al., 2009; Senge, et al., 2008; Wheeler, 2013). A critical part of creating this sustainability revolution (which is already forging ahead in places) is acknowledgement and understanding of the relationships between people and the Earth's ecosystems at both abstract global scales and more grounded, local, and everyday levels. Such socio-ecological dynamics are increasingly recognised by, and integrated into, contemporary research and practice, for example in fields of ecological economics (Costanza & Daly, 1992), resilience (Andersson, 2006; Folke, 2006), environmental sociology (Čapek, 2010), education (Cortese, 2003), planning, design, and engineering (Childers, et al., 2015).

'Ecological reflexivity' has been deployed to describe the active recognition of this people-planet connection. It has appeared in a number of (generally unrelated) works over the years (Goodman, 2010; Luke, 1998; Mellor, 2000; Plumwood, 1998; Plumwood, 2002; Smith, 2006) alongside other emergent, synonymous descriptors (e.g. 'ecocentric radical-reflexivity'; Allen, et al., 2017). Despite this, there has been little express explanation or theoretical exposition of ecological reflexivity (ER). Only relatively recently has it been formally defined, in two independent streams of literature. Manuel-Navarrete and Buzinde (2010) define ER with reference to the reflexivity of classical sociological theorists (Beck, et al., 1994; Sewell Jr, 1992), while Morita (2010) constructs ER upon ideas from contemporary environmental education scholarship (Nagata, 2002, 2006; Thomashow, 2001).

Conspicuously absent from the literature on ER is reference to, exploration of, and development upon Bourdieu's extensive scholarship on reflexivity (Bourdieu, 1972, 1990a; Bourdieu & Passeron, 1977; Bourdieu & Wacquant, 1992; Wacquant, 1989) and his associated theory of practice, habitus (Bourdieu, 1972, 1990b). This omission may be a consequence of the notorious inaccessibility (Jenkins, 2002) of Bourdieu's "impenetrable prose" (Swartz, 1997, p.13)⁷⁴ or it could be that modern sociological and educational conceptualisations of reflexivity are deemed to provide more relevant reference points.

Nevertheless, Bourdieu's work remains poignant to the conceptualisation of contemporary socio-ecological relationships, as the emerging theory of ecological habitus and analogous ideas demonstrate (e.g. Gäbler, 2015; Haluza-DeLay, 2006a; Haluza-DeLay, 2006b, 2008; Karol & Gale, 2004; Kasper, 2009a). Reflexivity has been discussed within ecological habitus literature (e.g. Crossley, 2003; Haluza-DeLay, 2006a), however, it remains one part of Bourdieu's theory that has not been elaborated upon or systematically explored there either.

74. Bourdieu's convoluted use of language has been justified by himself and others as a necessary and constructive part of elucidating the habitus nexus itself, prompting critical reflexivity and contributing to the evolution of academic style (see Jenkins, 2002, p.169 onwards).

Thus, there is plenty of scope for further Bourdieuan theorising to add value to the concept of socio-ecological reflexivity. Firstly, the concept of ER is being eagerly adopted across many disciplinary literatures, yet existing definitions are limited and siloed⁷⁵ from one another. Secondly, despite Bourdieu's extensive theory of reflexivity, there is no systematic consideration of *ecological* reflexivity through a Bourdieuan lens within existing ecological habitus or ER literature. Finally, the challenges of developing ecological habitus as a methodological tool and a way of framing practical change have been set, but not responded to, and Bourdieu's theories of habitus and reflexivity offer a template for achieving this.

Consequently, the aim of this manuscript is to deploy a Bourdieuan (1972, 1990a) optic to further develop the concept of 'ecological reflexivity', including a critical ecological reflexivity variant (critER) for conceptualising socio-ecological relationships and/or generating pragmatic pathways towards sustainability. I contend that Bourdieu's sociological reflexivity can inform the ontology and application of critER, just as his theory of practice, habitus (Bourdieu, 1972, 1979), has been used successfully to underpin the theory of ecological habitus (Gäbler, 2015; Haluza-DeLay, 2008; Kasper, 2009a) and synonymous concepts (Karol & Gale, 2004). I contend that ER can entail intentional-critical (critER), conscious-periodic, and/or subconscious-routine-embodied reflection and recursive adjustment within the ecological habitus dynamic (including ecologically salient dispositions, capitals, practices, and social fields). As an intentional research tool, I contend that critER can inform recognition, description, and understanding around ecological habitus of self (auto-critER), of others, or of specific groups involved in contemporary socio-ecological challenges; can be applied to evaluate the sustainability (or unsustainability) of ecological habitus; and can also conceptually frame, and assist in generating, practical sustainability changes that people could make in their daily lives.

7.2 TOPICAL LITERATURE REVIEW

This review discusses ecological reflexivity as it appears across disciplinary literatures, the concept's sociological origin, contemporary takes on Bourdieu's reflexivity theory, and ecological reflexivity as part of ecological habitus. 'Ecological reflexivity' is used in an incipient but largely disjointed literature to describe the interdependence of people and biophysical environments, the role of this relationship in ecological-sustainability, and how conscious and critical awareness of this relationship (i.e. intentional ecologically-reflexive practice) might be cultivated as a tool for practical change. While some literature on the topic has strong ties to classic sociological reflexivity theory, there is scarce dedicated theoretical development of the topic.

75. I.e. there are few cross-references between them.

The most comprehensive discussion of ER is by Manuel-Navarrete and Buzinde (2009, 2010), who nevertheless only dedicate a few pages to the topic. They contend that humanity's capacity for overcoming the global environmental crisis could be enhanced if interactions between society and the natural environment, within society, and even within people's inner-worlds were mediated through self-reflexive or 'transcendental' realisations of the dynamic co-construction of material (i.e. biophysical/ecological) and social structures (Manuel-Navarrete & Buzinde, 2009). They present "socio-ecological reflexivity" as a starting point for "making sense" of one's "transient life in the context of a living planet" and a potential starting point for more constructive socio-ecological agency (Manuel-Navarrete & Buzinde, 2010, p.143). Late modernity, they contend, is defined by individuals searching for personal meaning, which engenders routine and reflexive interactions within both social and material worlds. Their socio-ecological reflexivity entails an ever-changing and interdependent interiority (which includes dreams, fantasies, emotional responses, identity, thoughts, feelings, and tendencies to act); and tangible exterior practices within 'exterior' worlds of biophysicality, materiality, and sociality. "In the context of the current environmental crisis", they proclaim, "reflexivity is required to question how individual and social values and worldviews affect our ways of interacting with ecosystems and how this interaction in turn affects our own sustainability and wellbeing" (Manuel-Navarrete & Buzinde, 2010, p.144).

Manuel-Navarrete and Buzinde's (2010) ontology of ER is indexed back to classic sociological reflexivity literature including Beck, Giddens, and Lash's 'reflexive modernization' (1994), where contemporary Western society is conceptualised as being institutionally reflexive and continually reformative. Such contemporary concepts of reflexivity, in turn, are based on the reflexivity "explicitly formulated by Bourdieu as the systematic reflection on the unthought categories of our thought" (Beck, et al., 1994, p.210). However, this linkage is not explored by Manuel-Navarrete and Buzinde, leaving room for additional inquiry.

Elsewhere, Manuel-Navarrete and Buzinde (2009) also link their socio-ecological reflexivity to Sewell's (1992) conceptualisations of agency in the modern age. There, socially-sustained conceptual-schemas and material-resources (as two structuring factors) constrain or empower individual action, and recognising and acting upon these structures enables individuals to create intentional change. Sewell's conceptualisations are also elaborations of Giddens' (1979) 'duality of structure', which purports agency and structure to be an inseparable dialogic duality, and Bourdieu's theory of practice where individual agency and social structures continually co-construct one another (Bourdieu, 1972). Manuel-Navarrete and Buzinde (2010) acknowledge the roundabout influence of Bourdieu upon Sewell (1992), and Sewell upon their 'socio-ecological reflexivity', but do not critically elaborate on these underlying epistemological ties to Bourdieu. This is the closest that ER come to being linked to Bourdieu's sociological reflexivity in any ER literature that I reviewed.

Elsewhere, Morita (2010) approaches ER from an anthropological perspective, describing it as a continual, mindful/in-the-moment analysis of the environmental effects of one's actions. Reflection upon past action, he theorises, can reinforce or affirm environmental identity in the present, and enable conscious environmental attunement in the moment (i.e. conscious ER), along with monitoring of behaviour towards environmental 'friendliness'. Morita ties his conceptualisation to a mention of the concept in an ecofeminism piece by Mellor (2000), where she compares the subjugation of 'nature' in contemporary society to the subjugation of women in "modern male dominated society" (Mellor, 2000, p.119). Resolving the "malconnectedness" between social structures and the 'natural world' towards "sustainable connectedness" she argues, necessitates recognition that humanity cannot "transcend its ecological connectedness"⁷⁶ (Mellor, 2000, p.119). An "essentially dialectical" relationship exists between "hu(man)ity and the dynamic ecological whole", she argues, and this has its own independent agency (Mellor, 2000, p.118, parentheses in original). Therefore, without negating human agency, recognition of this "would always need to show *ecological reflexivity* and humility" (Mellor, 2000, p.118, emphasis added). Although Mellor's article provides context for her particular use of ER, she does not elaborate upon her epistemological positionality or definition of ER.

Morita's ER is also linked⁷⁷ to Nagata's (2006) work on transformative learning, and the importance of the capacity to self-reflect within intercultural and interpersonal communications. Nagata's 'bodymindfulness' "emphasizes the systemic, integral nature of lived experience" and the cultivation of wide-ranging awareness. She highlights how social experience often overrides physical (somatic) and emotional sensations and how reengaging this neglected aspect of self can be facilitated through self-reflexivity. She describes self-reflexivity as the link "between theory and practice". Contributing to Morita's theory, Nagata differentiates "self-reflection" as the act of reflecting (often with the intention of improvement) "after-the-fact", while "self-reflexivity" offers the capacity to create intentional action and change "in the moment" (Nagata, 2006, p.50).

Elsewhere still, ER has been deployed with the same intention implied, but without explanation, to describe human-environment relationships in general (Goodman, 2010); to describe the contemporary lack of "ecological reflexivity" in global, capitalist society (Plumwood, 1998, p.78; Plumwood, 2002) and in corporate economies (Luke, 1998, p.179); and as a proposed consideration within political decision-making (Smith, 2006) and eco-centric management education (Allen, et al., 2017). Others combine 'reflexivity' in the sociological sense, and

76. She goes on to state that "hu(man)ity cannot exist without 'nature' yet there is no 'natural' way for hu(man)ity to relate to it, human existence in nature becomes a political and moral question. How can we live? How ought we to live?" (Mellor, 2000, p.119). This line of questioning, which I only discovered late in my research, converges uncannily with my thesis title 'How then *could* we live?', set several years prior, one of several such convergences that I found between my grounded, Bourdieuan habitus based conceptualisations and existing (sometimes obscure) literature that came to light during my final validation phases (see another example in footnote 110, p.216). Much of this literature exists in parallel, siloed niches (i.e. in articles that do not cite one another or have common sources), and I hope to build bridges between these herein.

77. Morita and Nagata have both been researchers at Rikkyo University, Japan; where, for example, Nagata interviewed Morita as part of her communication research (Nagata, 2007).

‘ecosystem’ in a metaphorical sense to describe ‘ecosystems’ of socio-ecological ideas (Schlosberg, 2009; Schlosberg, 2012) and the same metaphorical application of ER is also used elsewhere, but without any socio-ecological relevance.

7.2.1 Sociological reflexivity

In comparison to the relatively inchoate references to *ecological* reflexivity, sociological reflexivity is a well established concept. Literature on this topic has redoubled in the past 15-20 years, especially by recognised theorists such as Archer (2007) and others (e.g. Adams, 2006; Beck, et al., 1994; Farrugia & Woodman, 2015; Giddens, 1991; Hibbert, et al., 2010; Sweetman, 2003). Sociological reflexivity is used in two main ways.

Firstly, it is used to describe the inherent, ongoing, and co-constructing dialogic relationship between individuals and society (Bourdieu & Wacquant, 1992) including how the two mutually and routinely influence, structure, reproduce, change, respond to, or otherwise continually adjust to one another (Bourdieu, 1990a). This incremental, responsive adjustment is a routine part of people’s everyday lives, many facets of which are accepted passively/unquestioningly, but which can equally be raised to conscious consideration, and/or be intentionally and critically analysed. Bourdieu’s influential works provide extensive theory around this form of reflexivity, which draws close ties to his interconnected concept of habitus (see Chapter 2).

The second distinct way that reflexivity is used is to describe a person’s intentional/conscious consideration of the socialisation processes described above (e.g. what Archer, 2007, p.4 describes as “self-talk”). In particular, an intentional/critical form of such reflexivity has a well established role in sociological inquiry as a (research) methodology (Bourdieu, 1990a; Bourdieu & Wacquant, 1992). There it is deployed to describe recognition of the diversity of perceptions (and therefore realities), ideas, socialisations, theories, languages/ nomenclatures, etc., that exist within and among people. Such reflexivity can prompt a conceptual “unravelling” of how knowledge is produced and used (Jahn, et al., 2012, p.9) and enable escape from “the mechanical routine of making decisions based on intuition, impulse, tradition, and authority” (Fien & Rawling, 1996, p.14). Thus, critical reflexivity can entail critical thinking (e.g. active questioning of assumptions, socialisations, etc.) through to transformation (engaging experimentation and/or learning to create change; Popa & Guillermin, 2015). Reflexivity as method is widely seen to promote self-awareness, professional development, interdisciplinarity and ongoing learning, and is an especially prominent theory/method in education (Hibbert, et al., 2010), environmental-education (Fien & Rawling, 1996), local governance (Jenssen, 2010), and more recently in transformative science (Schneidewind, et al., 2016).

7.2.2 Bourdieu's habitus-defined reflexivity and its modern developments

Here I elaborate on Bourdieu's influential reflexivity theory and corresponding concept of 'habitus' (see Chapter 2 for main review). Habitus itself describes the reflexive (ongoing, recursive, and generative) process whereby individuals and society co-construct one another producing continuity (and change) to norms, values, ideas, ideals, actions over time (Bourdieu, 1972). This is interminably entangled with the concept of reflexivity and examination of Bourdieu's well-developed concept of habitus consequently offers a depth of theory to any conceptualisation of reflexivity.

Bourdieu described critical reflection and change that transcends and potentially disrupts *illusio* as 'reflexivity'⁷⁸. Because individuals often inhabit the very social fields that shaped their habitus, Bourdieu observed that people generally exist in a state of 'illusio', an unquestioning commitment to the 'rules of the game' (Bourdieu, 1990b, 1998; Lizardo, 2004). Consequently, they reflect the characteristics of their surrounding social fields, with little cause to change or critically reflect on their dispositions⁷⁹, practices, capitals, or the dynamics between these and their social fields (Bourdieu & Passeron, 1977). He argued that a relative minority of individuals experienced/practiced reflexivity in this conscious way (extenuating circumstances aside). Those who did included: people who had experienced a rupture in their field (and associated devaluing of their capitals/social position); those perpetually competing in fields with others who possess more 'legitimate' capitals (e.g. the bourgeoisie versus the aristocracy of Bourdieu's era); and people schooled in reflexivity, such as the higher classes, academics, artists, and other intellectuals of the era (Bourdieu, 1979). While Bourdieu's theory of habitus is often associated with subconscious, socially determined and almost automatic forms of behaviour, this represents a deficient reading of his work (Guillory, 1997) – see Chapter 2.

However, reflexivity of one's social status, position, image, and role (among other things) is now arguably an inherent part of mainstream modern life and routine response to both social fields (e.g. educational and occupational) and issues of modern life such as identity-politics, consumption, technological advancement, and globalisation (e.g. Beck, et al., 1994; Farrugia & Woodman, 2015; Giddens, 1991; Lizardo, 2004; Reay, 2004; Sweetman, 2003). Moreover, it is recognised as occurring without people necessarily recognising/understanding the social forces involved (e.g. historical/political) (Farrugia & Woodman, 2015; Sweetman, 2003). Rather, the rapid and persistent change in many contemporary fields (e.g. cultural and scientific), and plurality of modern values, authorities, and lifestyle options available to people trigger a ubiquitous crisis of *doxa* and correspondingly, a more routinised reflexivity. Thus, an active and ongoing

78. In addition to the innate reflexivity of habitus, which describes how field adjusts to individuals and vice versa.

79. Dispositions are cognitive organisational frameworks and otherwise embodied proclivities that are engaged to decide (consciously or subconsciously) how to act appropriately in a given context.

adaptation of habitus (individual and institutional) through intentional and other forms of reflexivity is almost routine (Farrugia & Woodman, 2015; Reay, 2004; Swartz, 2002). Modern people are considered to deliberate on, and “strive to change their own habitus” on a routine basis (Sayer, 2005, p.30).

7.2.3 Ecological habitus and reflexivity

Bourdieu’s theories have been developed to inform contemporary socio-ecological research within the small body of literature around ecological habitus. Ecological habitus was coined by Smith (2001) to denote a practical sense and expression of an internalised ecological ethic, with reference to Bourdieu’s habitus, and has since been developed further from a Bourdieuan perspective. Ecological habitus can be thought of as (and has been theoretically developed to represent) the nexus of dispositions; capitals (including ecological variants of Bourdieu’s capitals; Karol & Gale, 2004); practices (e.g. around habitat, water, food, energy, waste; Kasper, 2009a); social fields (ethnic, religious, economic); and reflexivities that mediate the links between people and other forms of ecology (e.g. landforms, ecosystems, plants, and animals, and other social factors; Haluza-DeLay, 2006b).

Nevertheless, there has been limited theoretical development of the concept. Most extensive are Haluza-DeLay’s works (2006a, 2006b, 2008) examining environmental social movement organisations as communities of ecologically sound practice. These document how the social support and ability to practice ecological sustainability on a routine basis can develop durable sustainable ecological habitus. Haluza-DeLay applied ecological habitus as a normative and aspirational phenomenon and this corresponds with Smith’s initial use (2001). Haluza-DeLay called this ecologically ‘sound’ habitus; I call it ‘sustainable ecological habitus’ (see 2.5.3, p.46).

More recently, Kasper (2009a) proposed an alternative definition for ecological habitus, as a value-neutral concept that could describe any socio-ecological relationship ranging from ecologically antagonistic through to ecologically supportive. I deploy ‘ecological habitus’ in this impartial way. A value-neutral definition offers the researcher a greater range of descriptive, conceptual, and analytical potentialities. Kasper (2009a) correspondingly proposes ecological habitus as a conceptual tool and method for researchers investigating socio-ecological interactions that offers “different ways of thinking about socio-ecological phenomena and environmental behaviour, and a better understanding of the relational processes” involved (Kasper, 2009a, p.320).

This is more in keeping with Bourdieu’s ‘habitus’ as a “way of thinking” and way of “asking questions” (Bourdieu, 1985, quoted in Harker, et al., 1990, p.33). Additionally, Gäbler (2015) has suggested ecological habitus as a way of understanding and formulating approaches to broad-scale

socio-ecological transformation that are anchored to day-to-day practices, which bears further potential for research, including the establishment of parallels with Bourdieu's sociological works.

7.3 RESEARCH APPROACH

The development of ecological reflexivity theory and examples presented here stem from my exploratory research project, which involved interviewing 25 North American experts (see examples below) to gauge interdisciplinary thinking on the future sustainability of Western cities, and to identify strategic ways to advance this by changing the way we live on a practical everyday level. Experts working in Western countries and cities were targeted because these nations have the highest per capita ecological footprints worldwide (Ewing, et al., 2010), the majority of Western populations live in cities (UN, 2014), and a range of experts were available to be included.

Pinpointing strategic options for creating change towards sustainability is the focus of both classic systems theory (Meadows, 1999), and cutting edge climate science (Hawken & Steyer, 2017). Despite identifying and enacting innumerable solutions, however, many environmental problems persist at local, national, and global scales. People's day-to-day practices are one important (but often undervalued) factor in this challenge (Brand & Wissen, 2012; Gäbler, 2015) and exploring how to link the broad-scale need for sustainability to everyday practice underpinned this research.

7.4 METHOD

This research took a backcasting approach (Dreborg, 1996; Robinson, 1988) and used a dissensus Delphi methodology (Steinert, 2009) for data generation. Firstly, based on a literature review, 32 diverse experts with advanced specialised knowledge and interdisciplinary, solution focused, and forward thinking approaches relevant to the aim were purposively selected to interview (Littig, 2013). All were based in North America, a critical location for sustainability-transition research, which enabled diversity within the project constraints. Included were experts on sustainable cities and communities; environmental sociology, philosophy, psychology, and economics; social ecology; landscape architecture; urban planning, development, and design; public engagement, education, and health; community development; and environmental protection; from backgrounds including art, activism, academia and research, professional practice, not-for-profits, and federal government.

Initial invitations were attempted (on my behalf) by an Associate Professor (at the time) by telephone (3-16 weeks before proposed dates). Invitation by an academic of similar standing was

anticipated to improve access to experts. I followed this with emailed information sheets (about the project and participants) with exemplar questions if requested, and negotiated the final interview setting and time to suit each expert. Named identification of the experts was ethically approved, and consented to by each expert. Twenty of the 32 selected experts participated and five more were selected through snowball sampling (Bogner, et al., 2009). The qualitative and semi-structured interviews (23 face-to-face, one by telephone, one by email), typically lasted one hour, and asked high order questions to prompt critical exploration of specialised knowledge and practical understandings and experiences (Gläser & Laudel, 2009; Littig, 2009). Interviews were audio recorded and transcribed by the author.

An iterative and reflexive (e.g. Srivastava & Hopwood, 2009) bricolage approach was used to analyse the interview data (Kvale & Brinkmann, 2009), including inductive grounded-theory coding (Glaser & Strauss, 1967), and visual mapping (Maxwell, 2013). Formulation and interpretation of final backcasted pathways (constituted of normative future visions, strategic barriers, and practical solutions; Dreborg, 1996) engaged ecological habitus theory (Gäbler, 2015; Haluza-DeLay, 2008; Kasper, 2009a; Smith, 2001), informed by Bourdieu's habitus theory (1972) and newly incorporating ecological capitals (Karol & Gale, 2004) and natural capital (Costanza, et al., 1997). Quotes from the interviews are provided in the results of this manuscript to exemplify the interview and analysis outcomes, and are credited to each expert with their permission. See Table 4 (p.85) for a full list of interviewed experts and their roles.

7.5 RESULTS AND DISCUSSION

This manuscript is primarily focused on theory. Consequently, the main research outcome discussed here is my theoretical development of a Bourdieuan ecological reflexivity as a result of my interview analysis. Below, I outline my definitions and conceptualisations of ER and offer a preliminary example of how critER can be applied as a research method.

7.5.1 What is ecological reflexivity?

I conceptualise ER as analogous to the established notion of sociological reflexivity, only with a distinctive ecological focus. From a Bourdieuan perspective, a direct parallel can be drawn between Bourdieu's habitus and reflexivity (Bourdieu, 1972, 1990a), and ecological habitus and ER. Accordingly, ER can most simply be defined as (1) the reflexive processes that constitute ecological habitus, and (2) a person's awareness, reproduction, or (more or less critical) contestation of the same.

ER occurs with different degrees of intentionality and sophistication in the same way as sociological reflexivity. It can be routine, embodied, and subconscious, simply informing adaptation of ecological habitus in response to socio-ecological environments; or conscious (and potentially change-orientated) in a periodic or imposed way; and/or can be intentional, systematic, and critical, and even applied to ecological habitus of self, of other, or as a conceptual/analytical lens. Different degrees of these (and undoubtedly other) iterations of ER coexist within and across individuals, and ER is variable in quantity, configuration and deployment. The degree to which ER promotes awareness and conservation of ‘natural capital’ (i.e. all natural resources and the ecosystem services provided by the earth; see Costanza & Daly, 1992) also varies. I discuss a range of variant below.

a) **Subconscious/routine forms of ecological reflexivity**

This ‘subconscious’ reflexivity describes the end of the reflexivity spectrum where doxic, embodied and passive forms of reflexivity occur without conscious reasoning. Subconscious reflexivity is made up of subconscious reflection and recursion (Hibbert, et al., 2010; Platt, 1989), for example a passive awareness of the immediate outside world (reflection without conscious reasoning) and appropriate action in response to this world (passive recursion), using an instinctive and largely socialised ‘feel for the game’. This is a routine part of total habitus, operating with regards to many facets of everyday life, and can occur in combination with conscious and critical reflexivities (see below).

In the same way that everyone is socially reflexive (at least subconsciously and routinely) in response to various social fields, everyone possesses ER, as everyone interacts with natural capital and the ecological world. At this end of the scale, ER is a pervasive, embodied part of ecological habitus. Examples of this are breathing, eating, drinking, and sheltering, which involve direct interaction with ecosystems (the atmosphere, food systems, water sources, and natural resources such as construction materials and fuels), but routinely occur without conscious consideration or active intent. These demonstrate the effects (generally beneficial, but not always) of natural capital on people, but equally important are the ways that people effect natural capital, both negatively and positively.

b) **Periodic/imposed conscious forms of ecological reflexivity**

Alongside this, more conscious forms of ER also exist. Conscious ER occurs spasmodically as a normal response to ever-changing socio-ecological conditions. This can occur on a micro scale (e.g. unexpectedly getting rained on) or on a severe scale that ruptures socio-ecological doxa (e.g. natural disasters). Any changes to natural capital, socio-ecological capitals and practices, and/or social fields may spur conscious ER, and bring a new lens to elements of ecological habitus that have been taken for granted or routinised.

Additionally, ER can be spurred by something that feels subconsciously or consciously ‘wrong’, in a moral sense, in the same way that sociological reflexivity is often a moral modality (Sayer, 2005). Negative feelings (e.g. anxiety, fear, anger, etc.) can alert individuals to disruptions and contestations of otherwise subconscious ER, in turn provoking intentional conscious/critical ER. For example, confronted with a month’s worth of domestic waste in physical form⁸⁰ would stimulate awareness of practices, at least, and at best might illuminate the moral undercurrents that permit these practices to be routinely reproduced, prompting conscious/critical ER, and even an intentional shift in practice.

c) **Intentional critER**

A more critical strain of conscious ER (critER) can also be cultivated intentionally, enhanced, and developed with recurrent practice, in the same ways as sociological reflexivity. CritER involves a more broad-scale and pervasive recognition of socio-ecological interconnection. This modality of ER is most commonly invoked within the literature, often with the implicit assumption that it is underpinned by a sense of moral responsibility to the natural world (e.g. Mellor, 2000; Plumwood, 1998). Analogies can be drawn with ‘ecological imagination’ (Thomashow, 1996; 2001), which describes imagination (i.e. conscious reflection) upon the ways that people shape the natural environment, and how this shapes people in return. This is a *socio-ecological* parallel to Mills’ (1959) ‘sociological imagination’, which considers how individuals shape society and society shapes individuals.

CritER, like any intentional change can become routinised and dispositional over time, especially when supported by the social fields one operates in. Routinisation of reflexivity as part of sustainable ecological habitus was noted by Haluza-DeLay as a potential benefit of environmental social movements (Haluza-DeLay, 2006b, 2008). This has been documented as a feature of environmental activism (Crossley, 2003; Kirby, 2017) and corresponds with Morita’s definition of ER, as a continual, in-the-moment process (Morita, 2010).

d) **Cultivating critER**

A person’s capacity for conscious/critical ER evolves over time, enlarging or conversely atrophying in passive, imposed and intentional ways. Here I focus on critER as the most intentional and methodologically useful variant, which can occur with more or less depth and complexity, depending on several factors including a person’s:

- capacities for critical reflection (i.e. conscious questioning or conditions) in general;
- knowledge of relevant ecological systems (e.g. how hydrological cycles maintain water quality) and how people’s day-to-day practices affect these directly (e.g. water conservation in the home);

80. This idea was interestingly tested by activist Rob Greenfield (see Greenfield, 2017 on YouTube).

- understanding of sociological mechanisms (e.g. political economies);
- recognition of how these factors are linked (e.g. how economic policy can impact water quality and conservation in the home);
- capacity for translating these understandings into cycles of practical evolution and continuing intentional conscious/critical ER; and
- the capacity to critically and rigorously question all of the above.

Intentional enhancement of critER can be achieved, for example, through critical practice (discussed below); learning about different facets of ecological habitus (e.g. reading about systems of food production); practical experience (e.g. volunteering at a community garden); and socially (e.g. children introducing ecological initiatives from school to their families). In this way, critER encompasses the idea of developing ecological literacy (Hester, 2006; Orr, 2004; Thomashow, 1996). Comparing one's own ecological habitus to those of others (e.g. by immersion in a foreign social field) or spending time in a foreign ecological setting can also potentially expand one's referential world, altering the capacities listed above and thereby prompting more in-depth critER of one's accustomed practices and ecological habitus. These are analogous to ways that Bourdieu proposes to enhance reflexivity (Bourdieu, 1979). Finally, critER can be spurred by the intentional introduction of new practices, which necessitate conscious ER when first initiated, before becoming routinised and embodied over time.

Clearly critER can be conceptualised as a form of individual ecological (cultural) capital that contributes to individual habitus, in the same way that critical sociological reflexivity is a form of individual cultural capital within habitus. Additionally, just as an individual's practice of critical sociological reflexivity directly contributes to societal pools of cultural capital and overall habitus, developing and practicing critER adds to society's collective ecological capitals (i.e. the social and cultural variants) and ecological habitus. Similarly, actioning⁸¹ Bourdieu's four capitals (with or without conscious or critical reflexivity) can change economic and other material capitals, and actioning ecological capitals (by definition) leads to increases or decreases in natural capital. Finally, just as the social field continually and reciprocally influences the individual, natural capital continually influences and is influenced by human practices (and human life itself) at varying scales (e.g. molecular, thermodynamic, or catastrophic).

e) **Neutral critER as a conceptual tool**

In the literature, critER is primarily discussed as a way to develop conscious or critical awareness of these interconnectivities between people and natural capital, and respond to these in ways that enhance natural capital and its capacity of be sustained by people or to be self-sustaining (Mellor,

81. Leaving aside the observer effect of quantum mechanics.

2000; Morita, 2010). However, a value-neutral critER would provide a better conceptual tool for identifying, describing, and analysing potentialities for change across the spectrum of socio-ecological orientations (i.e. from the persistent unsustainable status quos to more sustainable⁸² variants). A Bourdieuan conceptualisation highlights the value of such critER as a research methodology (i.e. applied the same way that Bourdieu applied reflexivity), and this would respond to Kasper's (2009a) proposal for ecological habitus. Of the existing ER literature, Manuel-Navarrete and Buzinde's definition of ER (2010) most closely corresponds to this, but again does not take a Bourdieuan perspective to develop the concept.

Given the current state of the ecological challenges and impending crises faced by humankind, it seems imperative that individuals and collectives adopt and normalise critER interrogations to describe and analyse current habitus and identify points where change could be initiated within this in order to develop more sustainable alternatives. CritER highlights how ecologically sustainable habitus, dispositions, capitals, reflexivities, practices, and social fields are reproduced, what could be changed, and how change could become routinised and/or socially contagious. The challenge set by ecological habitus scholars, as discussed above, is for tools that foster such critER to be developed, and this corresponds with calls for innovative theoretical approaches and pragmatic critical reflexivity to be developed as contributions to the necessary sustainability revolution (Popa, et al., 2015).

Below I offer examples of how intentional critER might be engaged to such ends, firstly presenting a preliminary Bourdieuan logic of questioning that could be used to systematically examine a given ecological habitus and its sustainability using critER; and secondly exemplifying use of critER as an analytical lens for framing more abstract contemporary socio-ecological challenges of ecological habitus, and revealing potential and practical inroads towards their solution.

7.5.2 Mapping out ecological habitus with critER

A systematic form of critER could provide a framework that people in cities⁸³ could engage with to critically examine their own ecological habitus, or that of others, and evaluate its strengths and weaknesses with regards to ecological concerns. This may involve, for example, individuals such as scientists, researchers, city-planners, and leaders in business or government; and collectives such as city institutions, businesses, academic departments, environmental and social groups, and

82. I define sustainability as a way of living within ecological constraints so as not to compromise the environment for future generations. This can be seen as a baseline requirement (which remains unmet) as opposed to more aspirational alternatives, where ecosystems are regenerated and human wellbeing is enriched beyond this baseline.

83. My outcomes emerged from collective and distilled expert responses to interview questions about cities, and I therefore discuss my proposed approach as being relevant primarily to cities. However, this has broad potential salience for alternative applications.

families. Here I exemplify the application of such critER as an evaluative and potentially generative approach to creating pragmatic, ecologically sustainable change on an individual/group level.

Such a process could be organised in any number of ways, but the dispositions, capitals, practices, and fields of ‘habitus’ offer a functionally concise, yet infinitely flexible framework of conceptual factors to work with. In Table 9 (below), I outline a series of six questions to prompt systematic critER. An expanded version of this table with a variety of examples is given in Appendix 15, while Appendix 1 provides a brief case study example from my own ecological habitus. These questions can be considered to examine the existing ecological habitus of an individual or potentially a collective; reveal gaps in understandings or awareness; and potentially identify shortcomings in capitals, capacities, or practical action where change could be created towards sustainable alternatives.

Table 9: List of key questions about ecological habitus (informed by Bourdieu’s habitus) to prompt critical ecological reflexivity. See Appendix 15 for elaborated questions and further detail. See Appendix 1 for example.

1. What were the routine ecologically relevant dispositions and practices in your formative social fields (e.g. family, education)?
2. How have you embodied these social constructions of ecological habitus?
3. How are your ecologically relevant dispositions and practices supported or challenged by the social fields (e.g. family, friends, work, or clubs) that you now inhabit?
4. What capitals (economic, social, cultural, and symbolic) do you possess/lack and how do you deploy them to enact your ecologically relevant dispositions in practices?
5. In addition to the effects of your practices on natural capitals, what effects does natural capital (i.e. natural environments, resources, and ecosystem services) have on your everyday life, dispositions, capitals, practices, fields, and reflexivities?
6. How do your ecological practices contribute to the construction of ecological reflections and actions in each of your social fields, and how might this affect the collective/individual ecological practices of these fields/others in these fields into the future?

An individual (or organisation comprised of individuals) who chose to practice the intentional critER exemplified here could, over time, begin to embody such systematic critical questioning as part of their ecological habitus, strengthening the routine application of intentional critER within their everyday life. As this became part of their routinised ecological ‘game’, its day-to-day application would begin to ‘feel right’ and become normalised, while its absence would feel disruptive or dysfunctional. A similar situation of continual renewal and refinement clearly exists within contemporary manifestations of reflexive individualism (Beck & Beck-Gernsheim, 2002; Giddens, 1991), where individuals are routinely invoked to generate and reproduce self-conscious schemas of their identity, lifestyle, politics, occupational trajectories, moralities, etc., as discussed above (Farrugia & Woodman, 2015; Sweetman, 2003).

Moreover, routinised intentional critER would ideally continue to generate new practices and reflexivities as the socio-ecological contexts of everyday life evolved and as new knowledge-based and technological potentialities for sustainable ecological habitus came about. For example, if you were to replace plastic straws with glass or metal straws in your home, you might start to notice more when a café/store provides you with a single use plastic straw, and it might begin to ‘feel wrong’. These new reflexivities would also become embodied over time, ideally leading to the ongoing addition of more and more seemingly naturalised lifestyle practices of ecological attunement and sustainability.

I present the questions in Table 9 as a biographical cascade beginning in early childhood and tracing the socially reproduced, evolutionary cycle of habitus. The questions become a circular loop when the habitus of the individual feeds back to influence others in their social fields (Question 6), potentially including an influence on the formative stages of habitus (looping the cycle back to Question 1). This cyclic relationship is shown in Figure 12. This shows how the sequence of questions can be initiated at any point in this cycle, depending on the purpose of the exercise. An adaptation of such questions could similarly be used to examine the ecological habitus of a collective such as a family, social club, church group, etc. Moreover, I argue below, it has potential value as an analytical lens for examining and identifying prospective practical solutions to socio-ecological challenges.

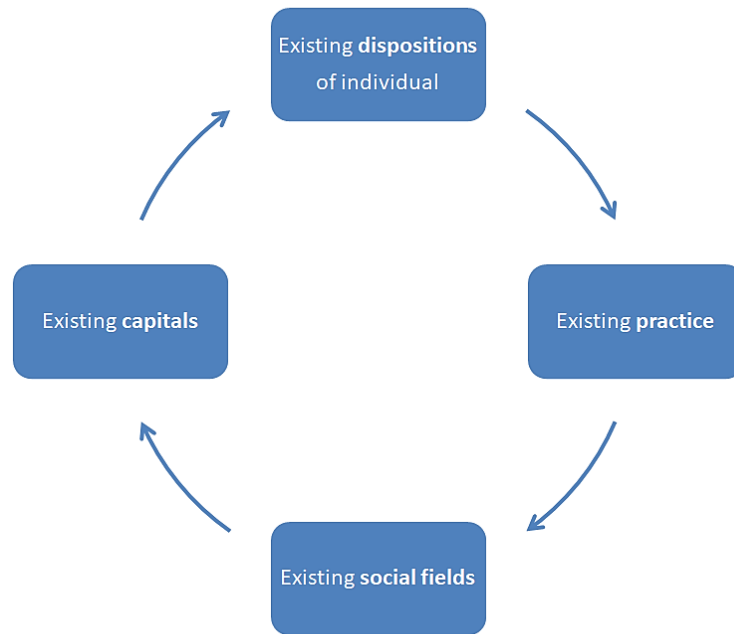


Figure 12: Model showing the cyclic flow-through of dispositions, practices, social fields and capitals of an existing habitus. Arrows indicate the most immediate ways that factors influence one another (e.g. changes to practice always occur in social fields, social fields always structure capitals, capitals always inform the dispositional ‘realm of possibility’, and practice is always informed by dispositions), however the arrows also ‘flow-through’ each factor and on to the others (e.g. changes to practice, happening in social fields, can then effect capitals, etc.). Ecological reflexivity describes (1) these cyclic effects and how each component affects and is affected by natural capital and (2) CritER entails conscious interrogation of these relationships.

7.5.3 Ecological habitus as a lens for critER research: an example

Now I highlight some of the key findings from my research and the interviews with 25 leading experts on cities’ socio-ecologies, which explored aspirational and practical ways of shifting Western cities towards greater ecological sustainability. I used an ecological habitus-based framework to conceptualise the diverse interview responses with critER. This included identifying socially embedded barriers to improving ecological sustainability in Western cities (as a part of existent ecological habitus), and generating ideas for strategic and practical solutions to overcome these barriers, beginning with pinpointed changes to everyday practice.

Here I provide a preliminary example of this use of critER as a conceptual-methodological tool for research. Analysis of the interviews unsurprisingly found that the experts viewed the predominant paradigms (i.e. habitus) that dominate in contemporary Western cities as ecologically unsustainable, and in need of change. The overarching conceptual frameworks that inform people’s practices (i.e. the dispositions of habitus) hold the keys to creating the necessary broad-scale change. Many of the socio-ecological challenges (e.g. escalating consumption, fossil fuel

use, suburban sprawl) that the experts highlighted as being most pressing in their geographical areas and/or within their disciplinary concerns could be (and often were in the interviews) traced back to existing and predominant Western paradigms orientated towards anthropocentrism, individualism, capitalism, globalisation etc., which contrast with a holistic worldview orientated to ER, and sustainable engagement with (and relationship to) nature.

One of the least considered, but most important problems is the one that underlies all of these problems, and that is a problematic relationship between ourselves and the natural world that has led to these symptoms of environmental degradation... [If we can] recognise that our ability to be fit, to be healthy, to be productive, to be happy, to be fulfilled as individuals and as a society is deeply dependant on our relationship to the natural world ... we would be in a much better position to solve all these problems.

*Stephen R. Kellert*⁸⁴

The overarching aspiration expressed through the interviews was the need for a widespread, collectively reflexive societal shift towards a more whole-system paradigm and associated practices that better honour humanity's ecological dependence. This can accurately be portrayed as 'sustainable ecological habitus'. A huge diversity of conceptual and practical approaches for creating such a broad-scale change was discussed by the experts.

I don't think there is a silver bullet; there is a silver shotgun... So there is not one thing that is going to pull the whole-system along. It's going to be multiple things, all happening in concert. *Robert Costanza*

The two examples given next demonstrate how some of these broad-scale and socially embedded barriers to ecological sustainability and their solution in Western cities can be constructively framed by ER, and the type of corresponding everyday practices that might contribute to overcoming them in creating sustainable ecological habitus. The first is the disconnection between nature and people's everyday lives, and the second is the disconnection between the disciplinary silos⁸⁵ within cities' institutional organisations. I do not intend to critique these ideas here, but to demonstrate an initial view of how ER can frame ideas around sustainability in general. The application of this to actioning change (e.g. through case study research) remains to be tested and this is of rich potential for future empirical research.

Firstly, the experts discussed the separation of urbanites from experiences of the natural world, and how this is an ongoing barrier to greater socio-ecological connectivity, particularly reflexive attunement (i.e. conscious/critical ER) and corresponding practices (i.e. enactment of sustainable

84. See Table 4 for list of experts and description of their capacities at time of interview.

85. I.e. normative, institutionalised social constructs that prevent interdisciplinary understandings and practices. For example, favouritism towards uni-disciplinary research in publishing and funding pools.

ecological habitus). The separation of children from nature was seen as particularly concerning, as it prohibits their early development of such ER during the main formative period of habitus, which might otherwise (potentially) become ingrained during childhood and persist lifelong, both in dispositional, subconscious practice and as periodic, critical reflexivities. Many of the experts referred to their own childhood nature experiences, often alongside family or teachers, as having influenced their own ecological habitus, building cultural capital (understandings and accordant reflexivity) of ecological phenomena, and offering practical (embodied) experiences of nature and examples of how to interact with nature, which informed their career paths and ongoing approaches in adult life.

Children today are not connected with nature. And that's not a theoretical issue; it's actually a real health problem for those children, psychologically and in their development... We need a connection to nature; it's how we evolved as a species.

David Beach

I think that is probably a necessary pre-condition ... to have a physical experience of spending time in nature. And then it would help if you have important social experiences in that environment as well, so that you get a sense, not just that you enjoy nature, but that the people around you also think nature is important. And then you have some important memories that are in natural surroundings. I think that starts to give you a sense of personal history that's tied to nature. It's not something you can really think yourself into; I think you have to have actual experience. *Susan Clayton*

This second quote in particular refers to the significance of the social field in supporting conscious/critical ER. Enhanced opportunities for children to have first-hand experiences in natural settings, both independently and as part of social learning, were seen by my experts as potential solutions to the human-nature disconnect, and building such reflexive, conceptual, potentially spiritual, and practical understandings of how to interact with nature during the formative years of early education has been discussed in depth elsewhere (e.g. Karol & Gale, 2004). Urban nature experiences for adults were also seen by my experts as important, bringing ecological considerations into everyday frames of reflexivity and potentially enabling the development of ecologically underpinned capitals and practices, for example, the knowledge and skills gained by gardening or bird watching. Again, this idea is supported by established theories of ecological literacy (Orr, 2004), ecologically democratic design (Hester, 2006), and ecological identity (Thomashow, 1996).

Examples of everyday practice from my interviews that entail first-hand experiences in nature for the person involved, and could enhance the formative (and ongoing) provision of such experiences for others in Western cities could include: planting a vegetable or flower garden at home (particularly on street fronts where others can interact with it), participating in community

gardening or fruit gleanings activities, participating in tree planting or habitat restoration, and becoming involved with local environmental organisations or governmental ‘green’ programs, influencing these fields.

A second barrier to broad-scale ecologically sustainable change in Western cities, identified through the interviews, was the disconnection between disciplinary silos (Gulati, 2007; Tett, 2015) within city institutions (e.g. in universities [Awbrey & Awbrey, 2001]; policy making, [Boschken, 2009]; sustainability education, [Cortese, 2003]; and research and academia, [Gazzaniga, 1998]). Most of the experts viewed top-down action from these institutions as critical to leading (e.g. envisioning, demonstrating, promoting, and normalising) and practically enabling (e.g. incentivising, resourcing) the required broad-scale shift in ecological habitus towards sustainability. This was because of the complex and global nature of current issues such as climate change, which require specialised understandings and coordinated responses, and also because of the widespread effects that city institutions could potentially have if their influence and power were applied to fostering ecological sustainability, as evidenced in some places already (e.g. Beatley, 2018; Floater, et al., 2013).

City leaders have privileged, and often significant, access to economic, social, symbolic and cultural capitals (e.g. specialised knowledge, professional networks, and financial resources). Most city leaders are also well schooled in critical reflexivity and reflection, an ability that is often developed and valorised in their educational and occupational fields. The city leader’s intentional deployment of ecologically attuned reflexivity, and accordant practical deployment of capitals (e.g. through policymaking and implementation, the material construction of city spaces, training, initiatives, etc.) can mean that everyday changes at an institutional level have potential to create broad-scale flow-on effects to many areas of society adjacent to (and ideally beyond) leaders’ everyday institutional reach.

Disciplinary silos were seen as pervasive barriers to this kind of leadership (through the siloed structuring of departments, and siloed opportunities for promotion, publishing, etc.) and as barriers to upcoming generations of city leaders (due to siloed education⁸⁶), inhibiting their development of, and/or ability to exercise socio-ecologically reflexive dispositions and ability to take interdisciplinary or holistic approaches. Greater attention to and practice of interdisciplinarity is therefore one point of latent potential for change towards sustainability in Western cities.

Education reinforces disciplinary boundaries... There is just no time in the curriculum to learn about the ‘edges’.⁸⁷ *Beverly Sandalack*

86. E.g. when higher education, projects, and publishing are organised into and managed via discrete disciplinary departments.

87. See section 8.3.3, p. 180 for unabridged quote.

Collaboration among people working from different urban socio-ecological disciplines and beyond (e.g. between communities, non-profits, researchers, local government, etc.) was seen as a potential everyday way of beginning to reconnect these silos, providing practice-generated critER, together with associated social and cultural capitals through routine practice (e.g. collaborative relationships, assimilation of knowledge, and practical understandings from other disciplines). This kind of collaboration would furthermore enhance institutional leaders and other affiliated individuals' ability to practice critER, better enabling them to understand and analyse their own ecological habitus, that of their discipline, and their silo-busting collaborations, and the ecological effects of their discipline/institution on wider society and on the natural world.

7.6 CONCLUSIONS AND RECOMMENDATIONS FOR FUTURE RESEARCH

Recognising the significance of socio-ecological relationships, understanding these, and improving them, is fundamental to the creation of sustainability. In the literature, 'ecological reflexivity' is proposed by a number of exponents as a concept that could inform this process. However, its various conceptualisations are siloed, it has not been theoretically developed in any depth, and conspicuously, it has not been informed by Bourdieu's extensive theory of sociological reflexivity. Interdisciplinary conceptualisations are a critical part of sustainability research, and this includes a need for theory with interdisciplinary capacity.

Here, uses of ER across disciplines are reviewed and united under a Bourdieuan lens. This perspective illuminates the spectrum of ER, from subconscious-routine through to intentional-conscious, and critical. As a conceptual tool, I argue that critER offers a systematic way to describe and analyse ecological habitus (of self or others), and its components, particularly the deployment of capitals (dispositional or intentional) within specific fields, resultant practice, and the consequent relationships to natural capital. Moreover, critER has potential as an effective and flexible lens for socio-ecological research in general, as it can be applied from descriptive, normative, aspirational, and pragmatic angles, as exemplified briefly herein, which responds directly to challenges laid out in the literature. Significantly, there are many day-to-day ways that individuals and institutions can cultivate and enrich their critER (e.g. self-disposing, and through collaboration) and apply it to formulate solutions in the pursuit of local and global ecological sustainability.

The previous two chapters described the theoretical developments that are substantial outcomes of my research, including my development of ecological habitus as a framework for conceptualising and assessing the sustainability of ecological habitus and my definition of the varying roles of reflexivity in the reproduction and change of ecological habitus. These ideas were presented first as they are relevant to the next portion of the thesis.

The next portion is comprised of three chapters that are structured as manuscripts. Each of these has a different topical focus, but all engage ecological habitus to frame and discuss a backcasted pathway towards sustainability in Western cities, as derived from the interview results. Each adds further nuance to my theoretical developments, exemplifies the potential of ecological habitus as a conceptual framing tool, and proposes further applications for its use in research.

Each also adds a unique topical dimension to my thesis. The first, Chapter 8, discusses the aspirational role of individual and institutional authorities in cities as potential top-down leaders of sustainability. Disciplinary ‘silos’ within city institutions can be a barrier to such leadership. However, I present collaboration as one practical option for individuals seeking to cross over the barrier of disciplinary silos and develop ecologically salient interdisciplinarity and critER, towards the creation of sustainable ecological habitus.

Chapter 8

SUSTAINABLE CITY LEADERSHIP AMIDST DISCIPLINARY SILOS

Abstract

Securing a desirable long-term future on Earth requires a widespread shift towards a more ‘sustainable ecological habitus’. Western cities are prime locations for instigating such change, because they are hotspots of escalating population and resource use, as well as wealth, development, and creative innovation. Many cities are already aspiring and acting to create sustainability, but the need remains for further ways to expand and expedite this process. I interviewed 25 prominent experts from a diversity of socio-ecological disciplines and influential city institutions (e.g. education, government, academia, urban planning, and design) to discover what strategic barriers exist to the aspiration of sustainability, and what targeted practical solutions could be enacted in response to these, to kindle change. Ecological habitus theory was applied to conceptualise and develop the results, because of its capacity to link broad-scale, abstract ideas with practical everyday actions; to describe the factors involved in socio-ecological stasis; and to diagnose and generate potential pathways for change. The experts agreed that one necessary pathway to sustainability is through leadership by institutional city authorities and that this requires interdisciplinary, socio-ecologically reflexive, and visionary approaches. However, the disconnection between institutional disciplinary ‘silos’ is a major barrier to this. Here I discuss everyday, practical collaboration across disciplinary silos as a potential solution and I propose ecological habitus as a tool for conceptually framing this as part of top-down sustainability, which city authorities could employ to develop their capacity for critical ecological reflexivity. Combined, these practical changes have the potential to begin breaking down the doxa of silos in city institutions, enabling city authorities to exemplify, enhance, and enable sustainable ecological habitus through their roles in city education, policy, resource allocation, etc., to the benefit of cities and socio-ecology as a whole.

8.1 INTRODUCTION

The need for sustainable socio-ecological interactions has been recognised for decades (Daly, 1990; Ehrlich, 1989; Meadows, et al., 1972; Randall, 1987; Schumacher, 1973) and continues to be a goal widely aspired to (Meadows, et al., 1972; Raskin, et al., 2002; Senge, et al., 2008; UN, 2015a). This need has also translated into pivotal international sustainability policy, from the initial United Nation's agenda on sustainable development (Brundtland, 1987) through to the most recent internationally adopted United Nations Sustainability Goals for 2030 (UN, 2015a, 2015b). Sustainability is multifaceted, but here I focus particularly on its role in managing human activity to ensure that Earth's fundamental ecosystems and natural capitals are sustained or enhanced in the long-term. This pursuit of sustainability is becoming increasingly urgent as ecological crises (e.g. climate change and mass extinction) intensify and globalise.

Western cities offer fertile ground for instigating the necessary socio-ecological change. First of all, Westerners have some of the highest per capita ecological footprints worldwide (Ewing, et al., 2010), leaving much room for improvement. Compounding this, up to 80% of Westerners now inhabit cities (UN, 2014), making them nodes of increasingly voluminous resource use and waste creation (Rees & Wackernagel, 1996). However, cities are also ideally placed to lead sustainable change. Indeed, a defining feature of contemporary sustainability politics is the decentralisation of sustainability policy and implementation, from the federal/national level down to individual city authorities (Barber, 2013; McGranahan & Satterthwaite, 2003; Ratcliffe, et al., 2006). City level government can lead more nimbly than national/federal governments, for example, via close engagement with local communities, targeting local sustainability issues (McGranahan & Satterthwaite, 2003), and creating local level change. The United States offers an obvious example of this. There, cities (individual and syndicated) have been responding to sustainability issues for decades as compensation for federal level failures (Rabe, 2004). Additionally, cities' concentrated populations foster accelerated political, cultural, social, and economic development, making them engines of innovation and change (Sassen, 2011). Finally, cities' political structures also support sustainability, with local authorities usually controlling entire municipalities, which enables them to plan for and manage resources in integrated ways (e.g. through infrastructure design), and cities' economies of scale generate the resources (financial, cultural, etc.) that local governments require to enact such ideals (e.g. through property tax) (Fleming, 2008).

Many frameworks and theories have been developed to promote sustainability in cities (Beatley, 2011; Hopkins, 2008; Leman-Stefanovic, 2012; Register, 2002), some of which have translated into practice (Beatley, 2018; TN, 2016), and some cities have even adopted wholesale sustainability. Stockholm, for example, now boasts comprehensive sustainability policy (e.g. around carbon emissions, transport, energy, urban form, housing, and resources), a functioning 'green economy' (e.g. investment, innovation, and employment), and more than 50% green/blue

cover across the city's land area. Key to Stockholm's success has been addressing ecologically-externalising market failures (e.g. through carbon budgeting and commercialisation of clean energy) (Floater, et al., 2013), which exemplifies the critical role of top-down leadership in creating sustainable change.

Despite sustainability being widely aspired to and beginning in earnest in some places, broad-scale sustainability is yet to materialise. Thus, comprehending the complexity of the socio-ecological problems involved, and envisioning effective ways to solve these remain core challenges for cities (Williams, 2010). Indeed, creating wholesale change in prevailing social paradigms in general, and towards sustainability in particular, is seen as an almost intractable challenge (Meadows, 1999). However, high order change can begin with progressive changes at the level of individuals on a day-to-day scale (Meadows, 1999).

Accordingly, I ask - What could we change about how we live today that could set Western cities on a pathway towards ecological sustainability? This research responds to this question with interdisciplinary, solution-orientated, backcasted pathways for sustainable futures (Dreborg, 1996) in Western cities. Each pathway was constructed by applying a lens of ecological habitus to analyse the insights from 25 qualitative interviews with socio-ecological city experts from fields including psychology, philosophy, public engagement, planning, government, design, activism, and art.

Creating sustainability in Western cities, these experts agreed, requires broad-scale social change towards more 'whole-system' paradigms and practices, which better recognise and incorporate ecological concerns. One crucial place for this change to begin is within city authorities, the people and institutions with significant influence on city-planning, development, operations, innovation, etc. In order for such authorities to lead top-down⁸⁸ change towards sustainability transitions in these sectors (alongside bottom-up and other forms of change), the experts identified a need for such authorities to assume more interdisciplinary, ecologically reflexive, and visionary approaches.

However, the disciplinary silos inherent to many city-based institutions were seen as major barriers to this kind of leadership. The siloed organisation of education, research, publication, etc., in universities (e.g. the separation of physical sciences from social sciences and of classical economics from natural resources) were seen as central to the intergenerational reproduction of

88. In this manuscript I use the concept of 'top-down' leadership to describe how, within extant city governance models, some sustainability solutions require everyday decision-making by individual and institutional authorities in positions of power who routinely command meta-level resources and are responsible for meta-level components of city life (e.g. research agendas, policy making, zoning, infrastructure investment, higher education curriculums, etc.). I argue that decisions made in these top-down contexts should be sustainability-leading and collaborative, therefore necessitating authorities capable of such approaches. Solutions presented here for the top-down should nevertheless occur in conjunction with (and may potentially become obsolete in favour of) radical, revolutionary, grassroots, indigenous, and other forms of leadership.

such silos. Disciplinary silos pigeonhole city authorities, inhibiting the propagation of the interdisciplinary socio-ecological understandings and practices that are required for sustainability leadership. Thus, overcoming institutionalised disciplinary silos was highlighted as an important and strategic way to create change for cities.

Collaboration was seen by the experts as a promising and practical starting point for disbanding the barriers presented by siled city institutions. Various forms of collaboration could foster socio-ecological interdisciplinarity within city authorities, providing them with more holistic perspectives on sustainability issues; better capacities to understand the complexities involved; and potentially more proactive, innovative, and values-based approaches to sustainability leadership. This would create a more sustainable ecological habitus in authorities themselves, and through their roles in city design, policy, education, etc., this could have ripple effects that benefit cities as a whole. Moreover, if a large enough proportion of authoritative individuals did the same, the structures, norms, and embedded practices of city institutions would also begin to evolve over time, with the potential for interdisciplinarity, critical ecological reflexivity (critER), and more sustainable approaches to replace disciplinary silos as routine parts of city institutions' habitus.

I present 'ecological habitus' (Smith, 2001) as a new conceptual lens for understanding and responding to this challenge anew. A variant of Bourdieu's (1972) 'habitus', a 'theory of practice', ecological habitus can be used to describe people's relationship with social and ecological systems and to assess the sustainability of these. Bourdieu's theory is pertinent as it describes how individual and social ways of life and people's worldviews are generated, reproduced, or changed, and illuminates the dynamics that lead to this in the form of dispositions, capitals, practices, social fields, and reflexivities. *Ecological* habitus can correspondingly illuminate factors involved in people's reproduction or change in terms of ecological sustainability (or unsustainability) (Haluza-DeLay, 2006b). I develop this theory as an analytical lens, contending that it offers a versatile socio-ecological research tool, and I apply it here to: (1) frame the role of city authorities as potentially powerful agents of sustainable change and key capital commanders within cities; (2) understand the socially embedded doxa of disciplinary silos; and (3) envision how everyday collaborative practices could begin to generate interdisciplinarity and critER within city authorities, lessening the silo effect and enabling better top-down leadership, towards sustainability in Western cities.

8.2 METHOD

Method is identical to previous manuscript – see page 157.

8.3 RESULTS

My results are organised in the form of a backcasted pathway, constituted of an aspiration, a key barrier to realising this, and a proposed, pragmatic solution to overcome this barrier. A collective and overarching outcome from the interviews, which was explicitly stated and inferred by the experts, was that a shift in the ‘paradigm’, ‘regime’, or ‘worldview’ of city people (and ideally beyond) is crucial for the successful creation of ecological sustainability. Technical or imposed change will not suffice. Expert Richard Register described this shift in worldview as moving towards a ‘holistic’ approach and others similarly described it as a ‘whole-system approach’. In particular, this included more relational understandings of humanity’s place as part of nature, alongside ecological components and systems; and the place of individual people as interconnected parts of wider society. The following quotes exemplify this collective theme.

Anything that can break down the atomisation of contemporary society is good, where people see themselves less as individuals, and more in a relational kind of context. And to me that relationality is not just within society, so relationality with our local ecology [too]. And with a local ecology there are no boundaries to it. Birds migrate across entire continents. We have long distance transportation of nutrients and pollution. So we are all interlinked, in all kinds of ways. I hope that we can see that relationality more and more. *Randy Haluza-DeLay*

My own view is that one of the least considered, but most important problems is the one that underlies all of these [environmental] problems, and that is a problematic relationship between ourselves and the natural world... The notion that’s deeply embedded in our modern society: that progress of civilisation is measured by our ability to transform and transcend nature, thereby becoming something almost god-like, non-biological ... [when in fact] our ability to be fit, to be healthy, to be productive, to be happy, to be fulfilled as individuals, and as a society, is deeply dependant on our relationship to the natural world. *Stephen R. Kellert*⁸⁹

8.3.1 The aspiration: authorities as leaders towards sustainable cities

When asked where in society this change in worldview and practice ought to be initiated, the majority of the experts (84% or 21/25) considered ‘top-down’ change as a vital component⁹⁰.

89. See Table 4 for list of experts and description of their capacities at time of interview.

90. This manuscript focuses on top-down approaches. However, other approaches were seen as equally important and complementary to this (i.e. bottom-up/grassroots level change and enrichment of cities with natural capital). These are discussed in subsequent chapters.

Well I think the change, first of all is going to have to happen from whatever the institution, and for no better word, government, I think the institution has to take the lead. Because in a democracy it's a representation of the mass, and these are large issues, these are not issues, I don't think, [that] you can do in a town hall meeting.

Walter J. Hood

Leadership from the highest structural levels of society was seen as critical to addressing the complex and global nature of pressing contemporary environmental issues such as climate change⁹¹. These crises necessitate high order, coordinated action, from leaders who promote, demonstrate, normalise, incentivise, and otherwise enable change towards sustainable practice across broad scales.

If you can identify leaders within the community and those leaders are on board with addressing climate change issues, we can use that as a top-down project to create policy or create programs or even as role models to foster changes in behaviour. Even though I am a behavioural scientist, and looking at things on the level of the individual, I think that long-lasting change can result from a top-down model. *P. Wesley Schultz*

[Part of] the solution to the problem is ... making it deadly convenient for people to do the right thing. That convenience needs to be elevated to the level of a master project for humanity... It needs to be more convenient to cycle than to drive, more convenient to take [public] transport, more convenient to have local food, more convenient to shop locally than to buy stuff from Taiwan. How you do that is the design problem of the age. *Greg Searle*

Additionally, many of the barriers (and potential solutions) to advancing sustainability in cities that the experts highlighted involved change to institutional structures themselves (e.g. government policy and the structuring of taxes) and the powerful vested interests of various stakeholders (e.g. political organisations and ecologically unsustainable, profit-orientated corporations). Advancing sustainability therefore necessitates top-level change to institutional structures, and to institutional leadership. This in turn would have effects on individual urbanites (e.g. through policy change; taxes; or the market privileging of ecologically sustainable commodities such as renewable energy).

The problem is not public opinion; the problem is organised-power resistance... Elites all over the world ... understand the problem. They know they need to do something about it. You can't get the government to act in some of these places, because of the structures, the incentives, and the costs: the national political economy. *Juliet Schor*

91. Climate change was seen by 12 experts as the most pressing environmental issue and eight more highlighted related, localised issues (e.g. fossil-fuelled energy, pollution, urban sprawl, sea level rise, and extreme weather).

I think the whole spectrum of incentives that people take are all heading in the wrong direction, and that sort of flows from our vision of what we are trying to achieve. Those short-term incentives are actually what drive people's behaviour... For example, we think we are paying less for coal-fired electricity than we are for wind-based electricity, when in fact we are paying more if you include all the costs, all the external costs. We think we are paying less for commercially produced agricultural products compared to organic products, when in fact the reverse is probably the case. So I think if you change those signals and incentives, people's behaviour will change really quickly. The problem is how do you change those incentives? And in order to do that you've got to impose some regulations and some changes at the larger level. *Robert Costanza*

8.3.2 Desirable sustainable city leadership traits

From the interviews, I gleaned an aspirational vision of the traits that top-down sustainability leaders would ideally have. Foremost was greater interdisciplinarity to provide for the development of more whole-systems worldviews as described above. Other key characteristics I term 'proactivity', 'innovation', and a 'values-based' mindset, each of which I discuss below. Leaders with these qualities were viewed as being more critically reflexive of prevailing assumptions and norms in general, and those associated with cities in particular.

Taken for granted values, assumptions and perceptions drive decision making in urban and environmental planning. Many of those beliefs are very powerful, even as they are implicit and rarely get the attention they deserve when it comes to understanding driving forces of societal change.⁹² *Ingrid Stefanovic*

- Interdisciplinarity

An interdisciplinary approach would allow academics, policy-makers, professionals and other city authorities (and incoming generations of city authorities) to better recognise the existing roles and the potential interconnectedness of different disciplines in creating sustainable cities, which would support the cultivation of whole-system paradigms in these authorities, and improve their potential as sustainability leaders.

One of the great challenges of our time is to return to more interdisciplinary ideals.... If we are going to be able to address many of our challenges, such as the creation of new cities that are more sustainable, it's going to require a far more interdisciplinary [approach]. Not 'multi-disciplinary', because if you throw a lot of colours together you

92. The expert's books discuss how taken for granted assumptions (hidden or implicit, but not critically reflected upon) around human-environmental relationships (especially in cities) need to be critically revised.

don't get a rainbow, you get a muddy brown. It's not just the different disciplines each working together on a project.... Really, truly 'interdisciplinary' is when they interact in such a way that what emerges out of it is different from what would have been the case with any of the disciplines alone, or even in combination: it's an emergent property... True interdisciplinary collaboration, that's where you are really getting a respectful and balanced integration of the disciplines, is not that common. It's surprisingly uncommon, and that is part of our problem. *Stephen R. Kellert*

- Proactivity

Nine experts discussed the near-future potential for environmental, economic, or social collapse and how widespread changes to dominant worldviews might not be possible until such tipping points are reached, at which stage the current status quo will no longer be an option. More proactive leadership and pre-emptive action was viewed as a potential way to lessen the severity of such crises (if not prevent them), as well as resulting in more desirable environmental, economic, and social outcomes, regardless. These discussions emphasised both the urgency, and the many benefits, of developing effective, interdisciplinary leadership in cities as rapidly as possible.

You hope that we can be a rational society, look at these risks, and say, "We need to act now, before bad things happen". The fear is that politics doesn't work that way, it's like the crisis has to happen and then people will finally act. *David Beach*

I don't think that the pace of value change is ... fast enough. If we had more time - if we had 100 years - but we don't. And the problem with this crisis is that we created it. It's our lifestyle, it's our largesse, it's our comfort... We have great examples. But will every city be able to transform to look like Amsterdam, become a bicycle community, and take the suburbs and transform them into higher density living with agriculture all around? Not until the crisis happens. When the crisis happens we will make do.... But it might not be nearly as elegant a solution as we had imagined... I understand my role, and the role of people like me, is to ... blaze the trail, so that when everybody is ready to change ... there is a path to follow... We can't wait for the crisis to happen. *Greg Searle*

- Innovation

Another topic that was raised repeatedly by the experts was the way that siloed disciplinary thought and action enables the preservation and perpetuation of ecologically unsustainable ideals from the past (and of the present) that continue to shape cities (intentionally, and unintentionally)

in unsustainable ways. Examples of this include the persistent notion of ‘sustainable *growth*’⁹³ (although many leading organisations are phasing this out in favour of sustainable development), the perpetuation of urban sprawl, and the ongoing material reconstruction of cities that have been damaged, or are projected to be at risk from climate change (e.g. New Orleans, where inundation is predicted to regularly reoccur). Some experts stressed the erroneous use (and underlying misunderstanding) of the term ‘sustainability’ to justify ‘sustaining’ or preserving these historical shortcomings as part of the contemporary status quo.

It’s ironic that we call it sustainability, coming from the environmental position, because it suggests that there is something, and then you have to keep it going. But if we learn anything from the natural environment, it’s that it’s entropic... If we were really thinking about cities that were sustainable, places like the Detroit’s of the world ... cities that burned... you’d just let those places go... and you’d take something out of the debris and you’d carry it forward. That’s true sustainability. *Walter J. Hood*

The experts correspondingly called for more innovative city leaders, who can contextualise contemporary cities as parts of a longer arc of history and foresee how they might progress with greater sustainability into the future (again necessitating interdisciplinarity). Such leaders could reconceptualise current cities, envision better futures, and generate alternatives of superior standards than existing archetypes, rather than reproducing (i.e. ‘sustaining’) failing status quos.

If all people know is what they’ve seen for the past 50 years, that’s their reality, how can you get them to think about a very different reality, where cities are done in a different way, where we’re connected with nature in different ways? I think it’s a huge educational challenge. It’s a huge challenge of leadership in creating positive visions of the future.... It’s hard to predict where things are going to go, but you can imagine it’s going to be radically different in another 50 years, so the question is whether it’s actually more sustainable and with a lower carbon footprint or not. And we can make sure that it is. *David Beach*

I think by understanding the history of normal, how things got to be the way they are ... it gives us the sense, which we don’t always have, that “Oh, things don’t have to be this way.” And so it gives us an empowered sense that things can change, and ... gives us tools for thinking about how we can more deliberately steer those changes... *Debbie Kasper*

93. Eternal growth is unfeasible in a world with biophysical limitations.

- Values-based orientation

Transforming the status quo to improve fundamental material wellbeing, health care, safety, security, freedom, and other widely held values was the final aspect of the experts' visions for sustainable city leadership, and also requires interdisciplinarity. This necessitates leaders who can elucidate what city dwellers deeply value, assess how these values are currently being responded to, and revise cities' structures (social, material, economic, etc.) to better provide for such values into the future. Indigenous authorities were viewed to be exemplary leaders in this respect.

We've got to look generations down the road, and try to understand what is of vital importance to them. Because when we discover that, we're going to discover what's of vital importance to us, and what might be superficial or political. So part of what I am trying to do ... [is] identify peripheral and negotiable values versus core and non-negotiable values... People in government, if they are given the freedom to, and the time, they will make these kinds of decisions; they know the difference between a core and peripheral value. They know the difference between negotiable and non-negotiable. *Bruce Morito*

8.3.3 The barrier: disciplinary silos

A key barrier to interdisciplinary and critically reflexive leadership of the kind outlined above that many experts discussed was the division of influential institutions, within Western cities, into discrete disciplinary silos.

All of these issues are interconnected. That's the key thing. So, you can't talk about ecology without talking about economics, or sociology, or psychology, or all of them. When it comes to understanding the systems, ecologists traditionally would look at or try to find pristine areas where people had no impact, so they could study what's going on without people, which is fine, but there really aren't any places that don't have some sort of impact these days. Economists, on the other hand, sort of ignore nature, and think that, "That's just a resource that we can substitute for if we need to"... To have a disciplinary specialty, that's not a bad thing, but you have to have peripheral vision and get outside your box much more often. *Robert Costanza*

Part of our problem ... [is] that we've developed enormous capabilities, both conceptually and technologically, through specialisation, and we've kind of pigeon-holed ourselves, just from a disciplinary perspective, in one or another of these specialties. And those specialties have been very, what you might call 'precocious', in trying to develop their understanding and their application within a particular domain of knowledge... And that has allowed for extraordinary advancements to occur within

each of these areas, in everything from chemistry to ecology... But what that's done has allowed these disciplines to develop in a very exaggerated way, independent of their effects on other aspects of life, and that's created all sorts of problems... *Stephen R. Kellert*

What makes such silos difficult to overcome was also discussed. Reasons included the lack of an overarching framework for understanding the diversity of issues (and disciplines) involved, communication difficulties between specialised fields, and translating knowledge into action. These were viewed as day-to-day struggles that individuals encounter within institutions when attempting to adopt more whole-system approaches.

I think that the tools are there, I think the knowledge is there, I think connecting the dots, that's a big gap. Not looking at just storm water, not looking at just air quality, not looking at just economic development ... but looking at them cumulatively and at a scale across the city. *Barbara Deutsch*

We kind of know the technical stuff, I think it's making it happen; that is the part that we're really lagging on. And I think we know a lot about how we could make it happen. It's been difficult to bring it all together in a practical way that can take advantage of the things that we've learned so far. *Debbie Kasper*

Additionally, the practicalities of working across silos (e.g. mixing of languages, approaches, methodologies, etc.), was also seen as complicated and sometimes difficult. For example, expert Aryne Sheppard described the tensions that sometimes exist between policy and governmental socio-ecological institutions, which “don't always gel” with grassroots/social movements.

The most widely discussed way that disciplinary silos prevent whole-system thinking was in the organisation of education, research, publication, etc., in universities. Examples include the separation of physical sciences from social sciences and of economics from natural resources.

Silos in higher education are especially significant, because they shape the foci of leading research and policy advice, and also contribute to the worldviews of upcoming generations of researchers, policy-makers, architects, government officials, etc., who will be tasked with creating, managing, and (ideally) leading sustainability in cities into the future. Experts recognised that there are increasing efforts to introduce interdisciplinarity into universities and other educational institutions, but that success of these efforts is an exception, not a rule.

Education reinforces disciplinary boundaries. Somewhat by necessity, but if you are going to architecture school, then the architecture accreditation body will say you need to learn this, and this, and this. Before you know it, the curriculum is totally full, and

there is no time to learn things like landscape architecture, or environmental protection, or psychology, all you are doing is learning architecture. And there is the same thing, I think, for a lot of the other disciplines. There is just no time in the curriculum to learn about the edges... Educational institutions, we really need to drastically change our programs so that we are truly more interdisciplinary and comprehensive. *Beverly Sandalack*

With interdisciplinary programs, there are cohorts of students coming out that appreciate collaboration, interdisciplinarity, in ways that are different than how we've thought about it in the past, and so I think a lot of the boundaries are starting to blur, but it takes time for the folks with the money and the journals to remove that mould in reality. *Debbie Kasper*

The incentive systems that are applied to university faculty were also highlighted as being part of this siloisation. Such incentives begin at undergraduate (and even high school) levels with the selection of discipline-based courses and majors, and silos persist all the way through academic careers, where opportunities for publication, evaluation for tenure, etc., are tied closely to particular disciplines. The experts saw these incentives as further reinforcement of siloed thinking at the expense of whole-system approaches.

One of the great perpetrators of the silos and lack of collaboration is the institution called the university; institutions of higher learning are so rigidified into their departments... For 20 years I've been looking at universities around this country [USA], and others, to see how much progress they've had in hiring interdisciplinary faculty, and even universities that have put in millions of dollars ... to bring on interdisciplinary faculty cannot manage to do it. Because ... by the structure of the university ... you have to be tenured in a department, and to get tenure in a department you have to write in that field, you have to publish in those narrow journals, you have to teach that thing. *Janice E. Perlman*

I don't think we have progressed nearly as much as we need to in figuring out how to do interdisciplinary work. We've kind of moved more towards multidisciplinary, but not true interdisciplinary. I think there is a lot of desire for it, but the reward system, whether it's in the universities or in the world of practice, is very disciplinary based. You don't hire 'interdisciplinary', you hire an architect, or you hire an engineer, or you hire an ecologist... If you are an academic, you don't typically get promoted for being interdisciplinary ... most of your interdisciplinary people in academia become so after they get tenure. It gives them security, and by that time they are so immersed in their disciplinary work that it's hard for them to be interdisciplinary. *Stephen R. Kellert*

Disciplinary silos dividing governmental departments, and their financial policy-making, were also seen as barriers to whole-system, top-down approaches (e.g. to city development and redevelopment), although some experts were beginning to see this changing. Expert Ellen Dunham-Jones exemplified the Office of Smart Growth⁹⁴, which now unites transportation, housing, and environmental departments and resources for the state of Maryland, enabling more efficient use of resources, and more holistic design and implementation of policies that effect sustainability. Expert Clark Wilson similarly discussed the Department of Sustainable Communities⁹⁵, which aims to enable such unity across American cities from the federal level.

Under some administrations it was almost illegal for us to talk to other agencies. So we have been really big about cutting the silos, breaking the silos, and working together... When they [communities] apply to us for particular issues that they are dealing with... we don't want to just get something from the department of planning, [we'll ask] "Do you have public works on your team? Do you have the public transportation? Do you have the affordable housing? Do you have all these other codes?" And we are still surprised ... [when] we go to meetings and workshops in communities, in small communities, and it's the first time ever that their transit person and their affordable housing person have met each other. *Clark Wilson*

8.3.4 The solution: collaboration

Despite such progress, it was clear from the interviews that overcoming the disciplinary silos still requires significant shifts in the organisation of institutions towards the kind of interdisciplinarity described above. This was perceived to remain as a challenging, if not intractable, pursuit. More widespread adoption of collaborative approaches was suggested as one way to begin to foster interdisciplinarity and reconnect silos that could begin in city institutions on an everyday level. I asked each expert about their experiences and understandings of collaboration, and whether existing collaboration towards sustainable cities was sufficient. The majority (92% or 23/25) thought the quantity and/or quality of collaboration between socio-ecological stakeholders in cities needed to increase, saw these increases occurring already, and/or practiced collaboration themselves. Thus, most saw collaboration as a worthwhile and necessary approach.

The value of formal, but particularly informal or inadvertent collaboration (where reciprocal learning results from shared experience), was emphasised as a way of facilitating interdisciplinarity, heightening critical reflection through comparison, and offering access to alternative practical understandings.

94. Established by the Maryland Governor's office in 2001.

95. Established in Washington, D.C., under the Obama administration in 2009.

What the literature and people in managerial positions think of as collaboration is those kind of more formalised organisational agreements. It has almost nothing to do with people's lived experience on the ground. In all of the studies that we have done, and in my own personal experience, 99% of the actual collaboration is in the form of very informal working relationships between front-line people who just happen to be in different organisations that are working together. Most of that isn't even on the radar screen with their managers or CEOs... And quite often the drive to formalise collaboration actually kills most of that more creative, more responsive, front-line work. *Blake Poland*

Expert Tim Beatley discussed how some disciplines (e.g. planning and architecture) work closely together, while others that are equally relevant to holistic considerations of sustainable cities may be distanced. He exemplified the relative lack of communication between his department (Urban and Environmental Planning) and the forest ecologists, hydrologists, and atmospheric scientists, who inhabit the offices just “across the street”. Expert Walter J. Hood discussed how sitting down together in a room with people from other disciplines or institutions can have real value, but that individuals have to be convinced of this value to make it happen, which too seldom occurs, and this was echoed by others.

It requires people to be placed next to each other, to have to interact ... with those who are not like themselves. To get out of comfort zones ... and to be out of those comfort zones for a long time, so that they in a way, ‘re-internalise’ things. *Randy Haluza-DeLay*

Some experts were concerned about the tokenistic or superficial use of collaboration (e.g. a ‘checklist of disciplines’ approach) to satisfy management, regulation, or public relations. Instead, they viewed collaboration to be most valuable when two or more individuals from different disciplines work closely together with a genuine will to benefit and learn from one another's strengths, resulting in a reciprocally acquired understanding of each other's disciplines. Expert Margie Ruddick exemplified the integrated interdisciplinary collaboration that she fostered in her Queens Plaza pedestrian and bicycle improvement project⁹⁶ in New York, describing, for example, how there “wasn't ‘a place’ where you ‘put’ art” within such a project, rather an artist participated throughout the process “to integrate art as a whole”.

Collaborating in this way was not just seen as a solution unto itself, but was importantly viewed to create mutual understandings, prompt constructive self-criticality, and foster the kind of ‘whole-system’ awareness and understandings that were seen as critical sustainability leadership attributes. Some experts discussed their own processes of learning and teaching through

96. See Ruddick (2018).

interdisciplinary collaboration, and how this affected their respective interdisciplinary capacities, inclinations, and understandings.

By working from an early age with non-philosophers, architects, planners, economists, [and] engineers, I was also convinced that interdisciplinarity was a critical component in advancing understanding of our world today. *Ingrid Stefanovic*

Meeting other people helped me to understand ecosystems and how they worked. I started going on hikes with the botanists here at the museum into the natural areas around Cleveland, and got a sense of how ecosystems operate. So as a writer and a journalist, you're out meeting all kinds of different people, and I was lucky to meet a lot of inspirational people who took time to educate me about all this. *David Beach*

The experts also described the many challenges that they had personally experienced when collaborating, or were aware that people often face, and practical ways they had overcome these difficulties, as well as general ideas for developing (or improving) interdisciplinary collaborative relationships (see summary list in Appendix 16).

They considered that socio-ecologically salient collaboration for city authorities could include, for example, people from different institutions, inherently interdisciplinary fields, complementary or divergent disciplines to one's home field, community or indigenous groups, or marginalised populations. This could begin with the smallest, everyday, and informal interactions to begin with, facilitating awareness and eventually understanding of different disciplinary perspectives, terminologies, and approaches. Ideally (even if incrementally) this might lead to integrated collaboration within teaching, research, publishing, applied projects, policy or program development, and/or within conference discussions or committee work, resulting in tangible ecological benefits. A key benefit to participants in socio-ecologically salient collaboration that I focus on here is the ongoing stimulation of critical ecological reflexivity and ever-evolving interdisciplinarity, which leaders in cities are widely recognised to require.

8.4 TOPICAL LITERATURE REVIEW

The purpose of this topical review is to verify and contextualise the interview results above within relevant literature in order to enhance the robustness of the discussions below⁹⁷. I review the role of city authorities as sustainability leaders and desirable features that such leaders can cultivate;

97. See 5.6.1, which validates the form and placement of this literature review, and Appendix 2 that outlines the epistemology of backcasting, which this review aims to fortify.

canvas literature on disciplinary and institutional silos; and consider collaboration as a practical circuit breaker for overcoming silos.

8.4.1 The role of city authorities as sustainability leaders

Proponents of sustainable change in prominent and powerful societal positions can have wide reaching effects on the rest of society (Meadows, 1999). Accordingly, city authorities can (and ought to) act as leaders in sustainability transitions. I use ‘authorities’ here to describe individuals and institutions with relative power and influence in cities, focusing mainly on institutions of higher education and local government (including policy makers, planners, etc.). In places, design and corporate leadership are also exemplified. ‘Leadership’ involves a process of influence (Opoku & Ahmed, 2015), and I refer specifically to sustainable city leadership here, which involves a process of influencing (e.g. exemplifying, enabling, empowering, instructing, etc.) people in cities to become more ecologically sustainable.

Universities are seen as lynchpins in this process of influence and potential sites for initiating wide spread societal change. Firstly, researchers and academics are frequently called upon to advance knowledge and interpret this for applied practice (e.g. policy creation). Secondly, as pedagogues, they are tasked with shaping the next generation of sustainability leaders (Cortese, 2003; Fien, 1997; Fleming, 2008), including those who take on forms of city authority (e.g. planners, designers, educators, strategists, and financiers).

Furthermore, leadership is demanded of governing authorities in the West by democratic mandates requiring them to protect the wellbeing of their constituency now and into the future. This has recently been reinforced in the legal arena, for example, with the landmark ruling that will force the government of the Netherlands to create more ambitious greenhouse gas reduction targets in alignment with the most recent climate science guidelines, to guard against potential hazards to the nation due to climate change (*Urgenda v. Netherlands*, 2015). Moreover, Margolin (1998) emphasises that even individual city authorities can lead transformative sustainability transitions, exemplifying Jaime Lerner, an architect who became mayor of Curitiba, Brazil, and drew national acclaim for his rapid sustainable transformation of the city’s urban planning and public transportation (Lerner, n.d.).

In addition to government, other city authorities are also called to lead change, including planners, for their role in sustainable development (Ratcliffe, et al., 2006), designers, for innovative sustainability solutions (Margolin, 1998), and corporates, who can lead sustainability through ethical and informed decision-making (Rooney & McKenna, 2008).

8.4.2 Desirable features in sustainable city leaders

Sustainability involves complex, continually-evolving systems, and managing these requires both understanding of the systems involved and continual adaptation of approaches (Costanza, 2014). Interdisciplinarity and reflexivity are therefore seen as critical qualities in sustainability leaders. Interdisciplinarity is defined as the unity and integration of two or more disciplines' knowledge, theory, methodology, practices, etc., to produce novel solutions (Nissani, 1995) that can provide 'hybrid vigour', and improve all involved (Cohen & Lloyd, 2014). My pragmatic definition of interdisciplinarity used herein spans all disciplinary syntheses (e.g. multidisciplinary, pluridisciplinary, crossdisciplinary, and transdisciplinary; following Nissani, 1995). Interdisciplinarity can be an individual mindset and skill, as well as a feature of a group (e.g. a research field or institution).

I focus specifically on interdisciplinarity that promotes holistic understanding of socio-ecological systems and the creation of ecological sustainability (or ideally enrichment) within these. At its most aspirational, such interdisciplinarity entails synthesis of ecological, economic, environmental, technological, scientific, social, cultural, spiritual, political, philosophical, ethical, and aesthetic factors across varying spacio-temporal scales (Selby, 2006), and accounts for the roles of civic engagement, peace, and human rights (Fien, 1997).

Such interdisciplinarity is also a quality of significance for sustainability researchers because sustainability solutions must cut across disciplines (Awbrey & Awbrey, 2001). Uniting the broadly siloed schools of social and ecological thought and practice, in particular, is crucial to creating sustainability in cities. While some models attempt to link these (Pickett, et al., 2001; Sterman, 2012; Taylor, 2007), the challenge persists. For example, urban sociologists (Čapek, 2010) and designers (Childers, et al., 2015) are still challenged to improve their understandings of nature in cities, while ecologists must better incorporate anthropogenic/social concepts (e.g. from city policy, planning, psychology, and political science; Alberti, et al., 2003). Sustainability education is correspondingly challenged to permeate these disciplinary boundaries as it shapes future city leaders (Cortese, 2003; Selby, 2006).

Whole new interdisciplinary fields have also emerged as responses to such challenges. For example, 'resilience' (stemming from adaptive management), has emerged as a theory and field uniting ecological systems (e.g. disturbance and non-linear dynamics such as climate thresholds) with social systems (e.g. institutional inertia, learning, leadership, and social networks; Folke, 2006). Interdisciplinary approaches have also arisen to address urban-design issues (Benyus, 1997; Kellert, et al., 2011), to envision and improve human-nature connections in cities (Beatley, 2011; Beatley, 2018; Register, 2002), and to plan for comprehensive community change towards carbon-neutrality (Hopkins, 2008).

Such interdisciplinarity inevitably provokes critical self-reflexivity in people as it generates “fresh ... images of the world” (Gill, 2016, p.380). It can also enhance (with practice) “receptivity to new ideas” (Gill, 2016, p.379), including critical awareness of one’s disciplinary limitations. Interdisciplinarity is accordingly seen as a form of reflexive research (Jahn, et al., 2012), and critically reflexive methodology a form of interdisciplinarity (Popa, et al., 2015).

‘Critical reflexivity’ describes “unravelling” of the processes of knowledge production and use (Jahn, et al., 2012, p.9) that heightens one’s recognition of the educational, social, political, and other interdependencies involved (Fien & Rawling, 1996; see Chapter 7). This entails ongoing learning, thereby fostering humility, flexibility, adaptivity, and awareness of multiplicity, which is desirable in leaders (Schein, 2010). In particular, reflexive critique of disciplinary socialisations (e.g. biases tied to a discipline) can enable all scientists (i.e. those engaged in systematic knowledge production) to adaptively revise their theories and paradigms to keep abreast of change (Kuhn, 1970).

Reflexivity is therefore also called for in sustainability management (e.g. Allen, et al., 2017; Kelly, 2006) where critical thinking, reflexive-self-assessment, and actioned transformation are ongoing requirements (Popa, et al., 2015). It already has a long-standing place in sustainability education theory, because pedagogues’ own socio-ecological relationships and practices (and assessments of these) are recognised influencers of upcoming generations (Fien & Rawling, 1996; UNESCO, 2014). Critical reflexivity in this context interrupts the “mechanical routine of making decisions based on intuition, impulse, tradition, and authority” (Fien & Rawling, 1996, p.14), facilitating novel, adaptive, interdisciplinary, and solution-orientated alternatives (Popa & Guillermin, 2015). Similarly, critical reflexivity is required from sustainability leaders in planning (Howe & Langdon, 2002), design (Hester, 2006) and city governance (Smith, 2006).

Interdisciplinarity and reflexivity can furthermore enable other desirable leadership qualities, such as: holistic understandings of the ‘big picture’ required to ‘re-imagine’ cities for a more sustainable future; conceptualisation of the enduring time dimensions involved; the ability to learn from personal and disciplinary/institutional-historical mistakes; and creativity to adaptively solve problems (Ratcliffe, et al., 2006).

The final sustainable city leadership attribute that I review is the capacity to generate, express and enact sustainable city visions (Ratcliffe, et al., 2006). Given that existing approaches have not managed to secure ecological sustainability in any nation of the Western world (O’Neill, et al., 2018) and are not projected to do so in the future, better visions of preferable alternatives are surely needed. Such visions can change people’s expectations and behaviours, and open up the options that people perceive to be possible for them, and desirable for collective futures (Ilstedt & Wangel, 2014; Neuvonen, et al., 2014; Phdungsilp, 2011; Quist, 2007). Creating such positive

visions is therefore an important sustainability leadership attribute (Harré, 2011). Such vision requires leaders who can imagine new, aspirational alternatives, based on an understanding of the deep values of city dwellers; and the ability to initiate sustainability transformations proactively (e.g. Mayor Lerner in Curitiba), in contrast to continuing politically ‘safe’ but unsustainable status quos, or resorting to short-sighted ‘quick’ fixes (Fleming, 2008), which are currently the norm for too many city planners and politicians (Ratcliffe, et al., 2006). Rooney and McKenna (2008) similarly call for foresight, insight, and imagination from corporate authorities, whose proactive sustainability (i.e. acting ahead of regulation or protest) they argue is an ethical responsibility and potentially a competitive advantage (Epstein & Buhovac, 2014).

8.4.3 Disciplinary and institutional silos

Among renaissance scholars, reflexivity and interdisciplinary socio-ecological approaches were routine (Costanza, et al., 2007; Wilson, 2014). However 20th century specialisation, industrialisation, and compartmentalisation of labour flowed over into siloisation in the organisation of knowledge (Costanza, 1996), which is today seen as a barrier to the above leadership qualities. Discussions of disciplinary ‘silos’ and the ‘silo effect’ have significantly increased in the past 10 years and continue to escalate⁹⁸. Silos entail the “dysfunctional segregation of ... disciplines”, “often caused by differences in ideology, scientific fragmentation, and professional misunderstanding that limit the ability of one discipline to sufficiently interact with another” (Boschken, 2009, p.1). This can lead to impermeable boundaries, which limit people to “favorite and habitual lines of vision” (Awbrey & Awbrey, 2001, p.276).

Despite this, silos are not generally⁹⁹ seen as problematic for sustainability in and of themselves. Rather, discrete disciplines are valued for their detailed knowledge of particular sustainability solutions (Botkin, 2000; Suzuki, 2007 [1997]). Nevertheless, in terms of socio-ecological relationships, the territorialisation of disciplinary perspectives is misrepresentative of reality and can be counterproductive in the pursuit of whole-system solutions (Suzuki, 2007 [1997]; Wilson, 2014). Indeed, as David Suzuki warns, the modern distance between disciplinary silos leaves “gaps” in our socio-ecological knowledge that are “large enough for the future of our planet to fall through” (Suzuki, 1997, p.32).

The most fundamental epistemological silos separate the natural sciences’ denotative objective perspectives (i.e. there is one true reality) from social sciences’ connotative perspectives (i.e. multiple co-existing realities; Awbrey & Awbrey, 2001), resulting in each forfeiting insight potentially gained from the other (Alberti, et al., 2003; Goodman, 2010; Williams, 2010). In universities, these silos are seen to be reinforced by “rigid department structures”, “deeply woven

98. E.g. a Google Scholar search for “disciplinary silos” returned ~2,500 results in 2016, rising to <3,500 in 2018.

99. Although some favour the complete dissolution/hybridisation of disciplines into ‘conceptual unity’ (e.g. Hall, 1999).

into the fabric” of academic life (Gazzaniga, 1998, p.1) that hinder communication, recognition of the interdependence of knowledge (Awbrey & Awbrey, 2001), and the overall advancement of science (Cohen & Lloyd, 2014). This is evidenced in sustainability publishing, for example, where “institutional obstacles to interdisciplinarity” silo environmental, economic, and social research from one another (Schoolman, et al., 2012, p.78). These silos can furthermore inhibit “growth, creativity, and spontaneity” (Gazzaniga, 1998, p.1), because they preclude researchers’ access to the “experimental spaces” between them (Schneidewind, et al., 2016, p.17). For example, scientists (social, natural, physical and engineering), policy makers, and other urban stakeholders have been found to perceive silos between disciplines as “hazardous border zones” to be avoided (Petts, et al., 2008, p.600) and the same effect is witnessed by students, whose ‘home’ disciplines tend to be siloed from systemic/interdisciplinary learning (Meyer, et al., 2016).

Silos are also reinforced by other incentive structures such as siloed disciplinary funding and promotion (Petts, et al., 2008), professional evaluations (Hugé, et al., 2016) and tenure (Cortese, 2003; Leshner, 2004) that sit “within the artificial boundaries of a discipline” (Cohen & Lloyd, 2014, p.209) and often make interdisciplinarity a risky career option (Schoolman, et al., 2012).

Communication across disciplines is also notoriously difficult, because terminologies, research frameworks (Popa, et al., 2015), dominant systems of ideas, symbols etc., have been developed in isolation, making them “internally coherent”, but often incommensurable across disciplines, even when they relate to the same issue (e.g. sustainability) (Awbrey & Awbrey, 2001). Furthermore, siloisation of different disciplines’ professional standards, theories, methodologies, and practices discourages exploration of foreign disciplines or invitation to outsiders (Cortese, 2003), fragmenting university communities and making it harder still for individuals to reach out across silos (Awbrey & Awbrey, 2001).

Thus, silos are institutionalised intergenerationally through higher education (Mayer & Frantz, 2004), producing graduates that reproduce silos, including those who become city authorities (Cortese, 2003, p.18). Beyond research and teaching, universities are further siloed into operations and facility design, investments and purchasing, policy and direction, public relations, etc., meaning that sustainability insight and/or practice gained in one area often fails to be incorporated into others or translated into systemic change (Cortese, 2003).

Within other city institutions, silos are seen, for example, to divide the public (e.g. city dwellers) from policy makers, which can result in public rejection of policies (Blake, 1999); and to separate policy makers from local biophysical conditions, which can result in policies that are ‘out of touch’ (Fischer, 2001). Finally, silos within governance can lead to ‘piecemeal’ public-policy around sustainability issues in cities, including separate consideration of transportation, economic development, migration, CO₂ emissions, pollution, and species extinction (Boschken, 2009).

8.4.4 Collaboration as a practical circuit breaker

Collaboration is a potential way to overcome disciplinary silos, and the extensive literature on this topic spans several decades and includes traditional, formal approaches (Gray, 1985), critical reviews (Speck, 2008), post-modern methodologies (Marcum, 2006), popular texts (Coleman, 2013; Sanker, 2011), and indeed, focus on collaborative leadership (Rubin, 2002). Collaboration can be representatively defined as the “synergistic relationship formed when two or more entities working together produce something ... [e.g. knowledge, understandings, products, or services] “much greater than the sum of their individual abilities and contributions” (Sanker, 2011, p.3). It is especially important in ‘problem domains’ (such as sustainability) where individuals or organisations cannot solve collective problems in isolation, or doing so causes unintended consequences for themselves or others; and when working together is more beneficial than competing (Gray, 1985).

Collaboration is thus a core tenet of sustainability practice (UNESCO, 2014). It is widely called for in academia and higher education, again because of these institutions’ far-reaching and intergenerational influences (Cortese, 2003), and is considered a key competency of sustainability education (Wiek, et al., 2011). As contributors to city sustainability, collaboration is similarly called for in design (Margolin, 1998), ecology (Alberti, et al., 2003), public administration (Burke, 2007), business (Sanker, 2011) governance and politics, law, technology, ecological science, and economics (Visseren-Hamakers, et al., 2012).

In general, collaboration is a valuable socio-ecological problem-solving and change-making method (e.g. Olsson, et al., 2004), providing practitioners with ‘action’ skills that are necessary for sustainability leadership such as communication, and conflict resolution (Byrne, 2000, cited in Karol & Gale, 2004). One widely called for (and widely enacted) way to develop these skills is through applied collaboration (e.g. ‘real world labs’), where students, pedagogues, community members, policy makers, city dwellers etc., unite to solve sustainability problems, enhancing the skills and understandings of participants (Byrne, 2000, cited in Karol & Gale, 2004; Schneidewind, et al., 2016). In a university, setting this can potentially reunite factions (e.g. research, operations, etc.) and transform both concepts and operations through inquiry-based sustainability problem-solving (Cortese, 2003). Many examples are provided by the individual and syndicated ‘green campuses’ emerging worldwide (e.g. OSU, 2017).

Interdisciplinarity, as discussed above, involves many “negotiations and recursive interactions between disciplinary practices” and disciplinary actors, and can thus be a process of collaboration in itself (Petts, et al., 2008, p.600). Cortese (2003) considers collaboration to be an antidote to siloed models of individualism and interpersonal competition in higher education, and Mann and Smith (2011) add that collaboration can provide whole-system ‘sustainable lenses’ for problem-solving, highlighting to participants that:

- All sustainability stakeholders (e.g. professions, disciplines, businesses, and city dwellers) have responsibilities and roles to play in creating sustainable futures, and a unique set of strengths, perspectives, and values, and must work together to create effective solutions;
- That socio-ecological phenomena operate as interconnected systems and the patterns, feedbacks, thresholds etc., that these entail must be recognised; and
- That sustainability is complex, uncertain, ever changing, and never ending, and will require multiple and diverse solutions across temporal and spatial scales (Mann & Smith, 2011).

Finally, at its heart, collaboration is an interpersonal process, requiring ongoing, recursive interaction between two or more participants. Pragmatically, this requires mutual trust, respect, humility, humour, structured time to negotiate, and a “willingness to climb out of silos and engage” (Petts, et al., 2008, p.600).

8.5 THEORY REVIEW

This manuscript draws on Bourdieu’s ‘habitus’ (1972), ‘reflexivity’, and correlated concepts of capitals, fields, dispositions, doxa, etc., to frame the results of the interviews. See Chapter 2 for a full review of Bourdieuan habitus. Bourdieu’s works have previously been proposed as potential tools for fostering adaptation and creation of new approaches within cities research; for kindling more radical sustainability transformations (Binder & Boldero, 2012); and for planning and land-use-development professionals wanting to understand and improve their embodied, routinised practices (Howe & Langdon, 2002).

Here I specifically contend that ecological habitus (Smith, 2001), a socio-ecological analogue of Bourdieu’s concept, can provide a useful framework for conceptualising the concepts of city authority, interdisciplinarity, critER, institutionalised disciplinary silos, and sustainability leadership that are the focus of this manuscript. As discussed in more detail in Chapter 2, Kasper (2009a) proposes ecological habitus as a conceptual and analytical tool for framing socio-ecological research and Gäbler (2015) highlights its value as a way to understand broad-scale socio-ecological challenges and formulate solutions to these that begin with day-to-day practice. I respond to these scholars, applying ecological habitus to conceptually frame my discussions of sustainable city leadership, interdisciplinarity, ecological reflexivity, disciplinary silos, and collaboration. I differentiate ‘sustainable ecological habitus’ as a normative aspiration for future cities (e.g. following the use of ‘ecological habitus’ by Smith, 2001 and Haluza-DeLay, 2006b) and apply ‘ecological habitus’ as a positivistic descriptor of ecological habitus variants that can be sustainable to unsustainable (following Kasper, 2009a).

I furthermore incorporate the notion of critical ‘ecological reflexivity’ (critER), an in-the-moment awareness (Morita, 2010) or critical awareness of socio-ecological interactions (Manuel-Navarrete & Buzinde, 2010) that is desirable in sustainability practitioners (Allen, et al., 2017; Kelly, 2006; Popa, et al., 2015) and a suggested feature of sustainable ecological habitus (Crossley, 2003; Haluza-DeLay, 2008). This can break the *illusio* of institutionalised practice (Fien & Rawling, 1996), facilitating iterative development of ever-more ecologically sustainable practices (Beddoe, et al., 2009; Popa & Guillermin, 2015). I present CritER as a way for city authorities to evaluate and question extant, siloed disciplinary and individual practice, and engineer more whole-system, sustainable alternatives.

8.6 DISCUSSION

In this discussion, I apply ecological habitus as a conceptual framework to present a prospective practical process of everyday socio-ecological collaboration that could enable city authorities to begin to overcome the limitations of institutional disciplinary silos. Developing on my interview results, I discuss interdisciplinarity and ecological reflexivity as aspirations for such authorities, which would enable them to leverage their privileged societal positions to become better sustainability leaders, and ideally exemplify, enable, and empower sustainable ecological habitus in whole city societies.

8.6.1 Leadership towards ‘sustainable ecological habitus’ in cities

On a fundamental level, creating ecologically sustainable cities requires broad-scale, societal ‘whole-system’ thinking and change that recognises the ecosphere’s role in sustaining life, and spurs accordant action with some urgency to protect and enrich this natural capacity. This idea formed the backcloth of the expert interviews that I undertook and is correspondingly pervasive in the literature (Meadows, et al., 2004; Raskin, et al., 2002; Senge, et al., 2008), and now aspired to globally (UN, 2015a). This aspirational combination of whole-systems thought and practice at individual and societal levels can be described as ‘sustainable ecological habitus’.

a) Where to begin? Pragmatic change and city authorities

Whole-system change represents an ultimate scale of socio-ecological transformation (Meadows, 1999), equivalent to transforming entire Bourdieuan social fields. A more pragmatic level at which change can begin is with individuals (Meadows, 1999), and at the level of everyday life (Brand & Wissen, 2012). At this level, the smallest of day-to-day practices can seed change towards sustainable ecological habitus (Gäbler, 2015; Haluza-DeLay, 2008). Collectively and over time, such individual change could inject sustainability into the ecological habitus of wider socio-ecological fields, such as those of disciplines, institutions, or whole cities.

This research highlighted the role of universities as prime sites for such change due to their dual roles as leaders of research that shapes city life and as education centres that shape generations of city authorities. These authorities are pivotal agents in the creation of sustainable cities because of their potential to catalyse large-scale and coordinated change from the top down (of course this must overlap with and have sensitivity towards bottom-up and other approaches). Accordingly, they represent a strategic leverage point for changing unsustainable systems (Meadows, 1999). In a Bourdieuan sense, these authorities occupy powerful positions in the city field, and have privileged access to capitals (economic, political, etc.), which they hold, deploy, and allocate to shape cities' social structures (e.g. through education; Cortese, 2003) and material environments (e.g. through infrastructure; McGranahan & Satterthwaite, 2003), with tangible impacts on overall ecological sustainability. Authorities' abilities to command capital varies across individuals and institutions, but in combination, they have the capacity for transformative change towards ecological sustainability (as the examples of Stockholm [Floater, et al., 2013]; and Curitiba [Margolin, 1998] demonstrate).

b) Aspirational qualities for sustainable city leaders

A first step towards authorities becoming sustainability leaders is for them to develop aspirational, sustainable ecological habitus in themselves. My research suggests that this significantly requires a 'joining of the dots' (as one expert put it), whereby independent disciplinary threads of socio-ecologically relevant specialist knowledge are woven together and translated into sustainable top-down practices (Awbrey & Awbrey, 2001; Selby, 2006). Such interdisciplinarity is not a sustainability solution unto itself, rather it is a lens for more accurately comprehending the complex and ever changing socio-ecological assemblages (ecological, economic, environmental, technological, scientific, social, cultural, etc.) that can enable/disable sustainability (Beddoe, et al., 2009; Costanza, 2014).

While the tertiary-educated middle classes, which make up many urban authorities, are inherently reflexive, and even critically reflexive (Sweetman, 2003), this does not necessarily translate into 'ecological' reflexivity, which requires ecological imagination (Thomashow, 1996) to conceive of people's actions and how these impact the environment (and vice versa), and a degree of ecological literacy (Orr, 2004) to recognise what constitutes the ecosphere and how fundamental and pervasive this is to life. An interdisciplinary set of socio-ecological understandings can provide this literacy and understanding, enabling such reflexivity to occur.

Both interdisciplinarity and critER can be seen as practices, capitals, and dispositions that can contribute to sustainable ecological habitus. Like any intentional practice, at first they must be consciously undertaken (e.g. as part of collaboration), but over time can develop as skills (i.e.

cultural capitals with ecological salience¹⁰⁰), and eventually become naturalised, embodied and routinised dispositions of people's ecological habitus, in the normal Bourdieuan way (1972). When tethered to the pursuit of sustainability, they can furthermore inform sustainable ecological practices. The experts furthermore also viewed socio-ecologically relevant proactivity (using foresight to act before needs must), innovation (adapting to changing conditions and envisioning new alternatives), and values-based decision-making (i.e. responding with socio-ecological integrity and reflexivity rather than habit), as desirable traits in city leaders and this is supported in the literature (e.g. in design, Margolin, 1998; corporate leadership, Rooney & McKenna, 2008). These attributes could also contribute to sustainable ecological habitus in city leaders if adopted as intentional practice and embodied into environmental/ecological dispositions to guide practice.

8.6.2 The ecological habitus of institutional disciplinary-silos

Through a Bourdieuan lens (Figure 13, below), disciplinary silos, which the experts saw as barriers to city authorities adopting the above features, and which are recognised as such elsewhere (Awbrey & Awbrey, 2001; Cohen & Lloyd, 2014; Cortese, 2003), can be conceptualised as long-standing paradigmatic structures of institutional fields, which are reinforced by the structuring of various capitals within these fields. This includes structuring of cultural capitals (e.g. siloed knowledge; Cohen & Lloyd, 2014), economic capitals (e.g. siloed funding and tenure; Cortese, 2003), symbolic capitals (e.g. siloed career progression/promotion; Tett, 2015), and social capitals (e.g. silos prohibiting institutional community) (Awbrey & Awbrey, 2001). These structures become embodied by individuals (top of Figure 13) within these institutions, who are accordingly 'pigeon-holed' (as one expert put it), or 'structured by' these siloed 'structures' (Bourdieu, 1990b), and may themselves go on to reproduce the same structures in any institutional field that they inhabit, routinely reinforcing and perpetuating the siloed disciplinary habitus across institutions, and through time. Additionally, because of their positions of relative power in wider city fields, authorities' enactment of disciplinarily-siloed dispositions, through practice (right of Figure 13), has radiating impacts on city sustainability as a whole.

100. Karol and Gale (2004) call these 'environmental capitals' and I term them 'ecological capitals' (see 2.5.3, p.46 & 6.4.4, p.136).

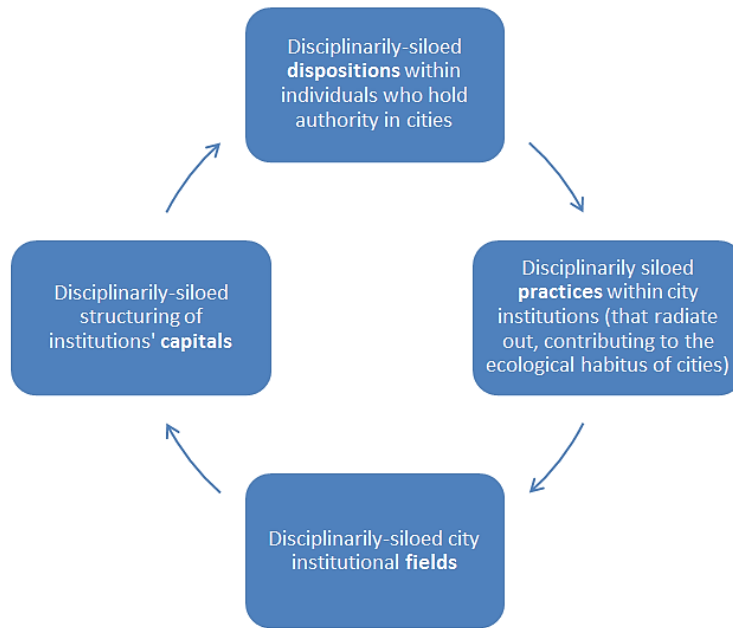


Figure 13: Model of disciplinarily-siloed habitus in city institutions. Arrows show how each factor cyclically produces and reproduces the next.

Silos are viewed as core perpetrators of what can be viewed as ‘disciplinarily-siloed illutio’. To be clear, disciplinary silos are only one feature of contemporary authorities’ habitus, but they are perceived and evidenced to be a feature that reinforces separation of social and ecological paradigms, contributing to practices with unsustainable (and often unrecognised or perceivably externalised) outcomes for cities, while correspondingly inhibiting the whole-systems perspective that is required of authorities for them to lead change towards sustainable ecological habitus. At the broadest scale, this includes the siloed conceptualisation of people as separate or apart from nature (Costanza, et al., 2007), contributing to the practiced objectification and commodification of nature (Suzuki, 1997) and accordant, unsustainable ecological habitus. At a more practical, everyday level, silos inform authorities’ doxic deployment of capitals, imbuing the same effect into public-policy, city-planning, education, etc., in routine and pervasive ways. At this level, the effectiveness or failure of authorities as leaders of sustainable ecological habitus can be measured, and is evidenced to be failing in many places, by the expanding and unequivocally unsustainable ecological footprints¹⁰¹ of cities (Rees, 1997; Rees & Wackernagel, 1996; Wackernagel & Rees, 1998) and the lack of vision within authorities that is recognised by my experts and other scholars (e.g. Costanza, 2014; Jenssen, 2010; Ratcliffe, et al., 2006).

101. Considering cities’ ecological footprints highlights another feature of ecological habitus neglected in extant literature: ‘natural capital’ (Schumacher, 1973). Natural capital comprises Earth’s stock of natural, non-manufactured capital (e.g. plants, animals, the ocean, and the atmosphere), and the potential/realised goods and services that these provide (e.g. climate regulation, oxygen, and food). Because people’s interactions with natural capital distinguishes ecological habitus and is what the theory endeavours to portray, ‘natural capital’ ought to become a stated component of ecological habitus in addition to Bourdieu’s traditional capitals.

8.6.3 Collaboration as a practical silo circuit breaker

Introducing the practice of collaboration into everyday practice is a potential circuit breaker to this procreant cycle of disciplinarily-siloed institutional habitus. Collaboration that draws together authorities from across a spectrum of socio-ecological disciplines and beyond (e.g. collaboration with regular city dwellers) was seen by the experts as an intentional and practical way that authorities could begin to bridge the disciplinary silos. Collaboration involves a dialogic connection (i.e. ongoing and dynamic ‘back-and-forth’ type of interaction) between people from two or more disciplines and/or from other sectors of city society (e.g. residents), resulting in emergent understandings on both sides (Sanker, 2011). From a Bourdieuan perspective, this entails engagement, at least, and immersion at most in a foreign (disciplinary, or other) field (Figure 14), which can provide degrees of contrast between them, and expand one’s referential world. Bourdieu viewed such immersion and contrast as an effective way to cultivate critical reflexivity (Bourdieu, 1990a), and the same applies here.

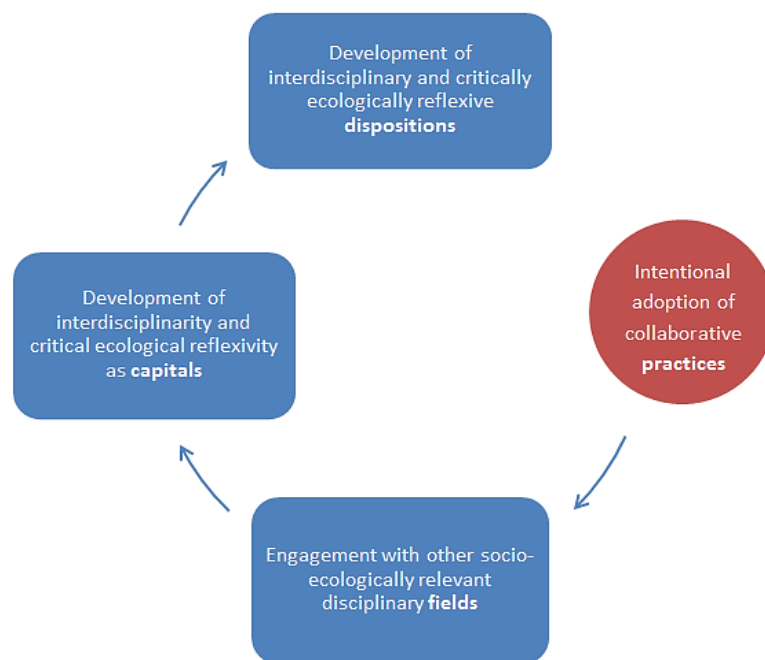


Figure 14: Model showing how intentional adoption of collaborative practice can feed into the development of interdisciplinary and critically ecologically reflexive capitals and dispositions in individual city authorities. These would ideally go on to contribute to a self-replicating or ever-enhancing cycle of sustainable ecological habitus. Arrows show how each component produces the next.

The depth and corresponding benefits of collaboration to developing authorities’ interdisciplinarity and critER depends on the degree of reciprocity involved between participants (Petts, et al., 2008). However, this can occur on a variety of scales. Collaboration as part of a

practical project (e.g. community sustainability endeavour), was promoted by the experts as a wide-reaching approach that offers potential for pragmatic and potentially nuanced interactions between a diversity of sustainability stakeholders alongside enacted sustainability benefits (Cortese, 2003; Schneidewind, et al., 2016).

At the other end of the collaborative spectrum is informal collaboration, the value of which some experts emphasised. This is a potentially more accessible scale at which to introduce collaborative practice, especially within rigid and siloed institutional structures. The active and critical reflexivity involved in immersive collaboration, as discussed above, can be too ‘disruptive’ (Hibbert, et al., 2010), and “messy”, and generate “doubt and contradiction”, or become overwhelming (Hibbert, et al., 2010, p.55), whereas everyday and informal collaboration offers a ‘softer’, more comfortable entry point that is less disruptive to doxa.

Nevertheless, this small-scale collaboration can initiate momentum and strengthen into silo-busting¹⁰² collaboration over time. Kreiner and Schultz (1993) emphasise the value of informal, ad hoc collaboration as a starting point for collaboration for this reason. Informal encounters of this kind can include friendships; casual meetings, conferences, or ceremonies (especially when held locally); and/or stem from people’s work as part of a board, research council, or task force (Kreiner & Schultz, 1993). These potentially unexpected combinations of people, information, and approaches can result in the sharing of news, visions, research ideas, and/or scientific/specialist knowledge, and if perpetuated over time can facilitate resource sharing (inside or outside of official frameworks), breed novel ideas, enable recognition of unexplored research frontiers, provide for inspiration and innovation, and develop into more formal collaborative partnerships over time (Kreiner & Schultz, 1993).

a) **Learning through collaboration and critical ecological reflexivity**

As a process of individual learning and disciplinary exchange, collaboration can contribute to individuals’ assemblages of understandings (intellectual and practical) that are necessary for socio-ecological interdisciplinarity (Cortese, 2003; Byrne, 2000, cited in Karol & Gale, 2004); for example, the ecological understandings that sociologists are called to develop (Čapek, 2010) and the sociological understandings called for in ecology (Alberti, et al., 2003). The comparison between home-discipline knowledge, methods, terminologies, practices etc., and those of other disciplines that collaboration can enable could highlight the relative contributions of each to the socio-ecological ‘big picture’, as well as the limitations of each, and the influence of siloed structures upon them. This describes a dissolution of disciplinary illusio¹⁰³ and heightening of reflexivity (Bourdieu, 1979). In accordance with this, interdisciplinarity and reflexivity are often

102. ‘Silo busting’ is used by Gulati (2007), in the context of commerce, to describe the same kind of silo-bridging discussed here, where innovative and solutions-focused outcomes come from inter-silo collaborations.

103. Illusio describes an unquestioning acceptance of the ‘rules of the game’ (i.e. the social status quo).

described as being inherently collaborative, entailing awareness of others and benefiting from mutual learning and the co-generation of ideas (Jahn, et al., 2012; Popa, et al., 2015). Such a cycle of practiced collaboration and embodiment of interdisciplinarity would iteratively strengthen authorities' abilities to apply critER to evaluate and improve the sustainability of their own ecological habitus and that of their disciplines, institutions, and cities.

In Table 10, I list some examples of the kinds of everyday practices that city authorities could engage with to begin examining extant ecological habitus (of themselves, their fields, etc.) and stimulate such critER. Ideas on this list could inform individual critER as preparation for fruitful collaboration, or could be engaged as tools in collaborative practice.

Table 10: Collaborative and/or ecologically reflexive ways to examine disciplinary ecological habitus, as informed by the expert interviews.

- Map out the long-term evolution of your discipline's socio-ecological concepts and practices and consider how they might change into the future.
- Organise a guided urban/nature/garden/project walk/ramble/crawl/working-bee where individuals from different disciplines take turns (on one occasion, or across a series of occasions) to describe what they see, smell, hear, feel, or taste from the perspective of their disciplinary habitus. Differences in habitus would likely offer entirely different views of 'a place'.
- Explore the margins/boundaries/edges of your discipline(s), and learn about related socio-ecological disciplines and/or interdisciplinary approaches (e.g. by reading, through discussion, or via attending divergent conferences).
- Seek critiques of your discipline's socio-ecological and other limitations.
- Critically evaluate the strengths and weaknesses of other disciplines' socio-ecological theories/practices including the pragmatism of their assumptions and externalities. Use this to inform evaluation of your own discipline.
- Consider different scales (e.g. temporal, geographic, demographic, economic, ecological, financial, political, organisational, and social) and the implications of these for socio-ecological issues and systems-based problem-solving.
- Invite consultation/ audits of your plans, products, or outcomes from a socio-ecological standpoints.
- Evaluate your discipline's applied solutions by observing them in action/on the ground, or by seeking feedback from affected stakeholders.
- Consider/enhance your discipline's influence on the city mainstream (e.g. by contributing to popular media).

In addition to this, collaboration with people who routinely practice critER and other sustainable activities (e.g. ecological/environmental critical theorists, sociologists, philosophers, radicals, artists, or activists) could further enhance these capacities, and ongoing collaboration with people in these fields could provide authorities with social support (Crossley, 2003; Haluza-DeLay, 2008;

Kasper, 2008). Either way, when practiced over time by individual city authorities, interdisciplinarity and critER as part of collaborative practice would become embodied dispositions (Figure 14), contributing to sustainable ecological habitus in the individual and ideally informing their influential top-down practices within broader city fields.

b) **Leading sustainability: a sustainable cycle with radiating effects**

The aspiration is that a critical mass of interdisciplinary and ecologically reflexive individuals within particular disciplines or institutions could kindle the same as a norm in their wider social fields. More common collaborations create a more collaboration-friendly research environment, encouraging people to take collaborative approaches (Kreiner & Schultz, 1993). For example, increased attendance at interdisciplinary conferences and publishing in interdisciplinary journals could lead to their enhanced symbolic recognition and financial backing; things that are called for by established collaborative and interdisciplinary scholars (Brown, et al., 2015). This increase in status could, in turn, make it easier for individuals to present and publish interdisciplinary work, for example, which is currently perceived to be difficult (Schoolman, et al., 2012). Additionally, some individuals with authority in city institutions could potentially have more autonomous effects on their institution's capital structures. For example, by affecting more interdisciplinary funding structures (Holm, et al., 2013) or revising teaching curriculums to better incorporate sustainability (Fien & Rawling, 1996).

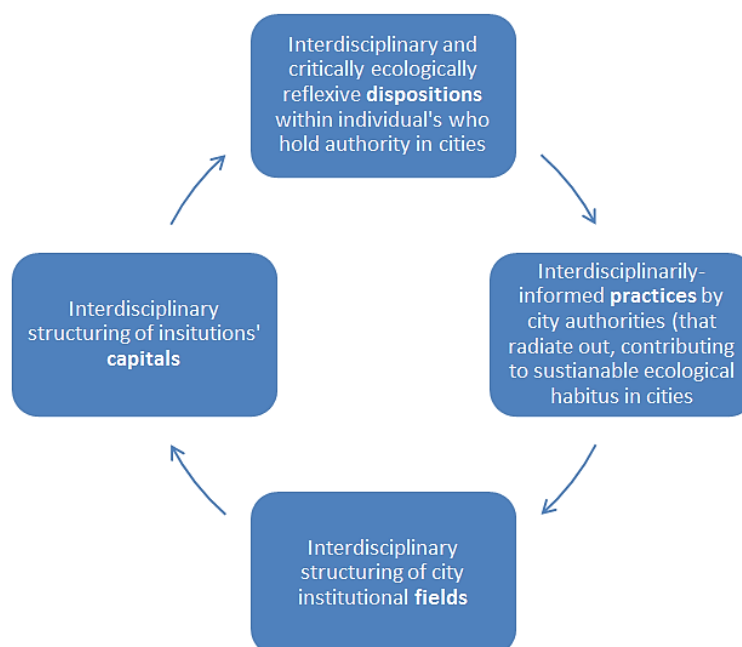


Figure 15: Model showing dispositions, practices, fields, and capitals of an aspirational interdisciplinary ecological habitus in city institutions. Arrows show how each factor cyclically produces and reproduces the next.

Such changes, moving away from disciplinary silos, would incentivise more widespread change of individual authorities' practices towards interdisciplinarity and critER, and normatively reinforce this within institutional fields. The aspirational sustainable ecological habitus that this would contribute to can be conceptualised as a cycle (Figure 15), whereby authorities with interdisciplinary and ecologically reflexive dispositions (top of Figure 15), which are potentially developed through collaboration, are played out in practice (right of Figure 15), effecting both material and social structures of city fields. This could include, for example, changes to cities' material structures and investment in ecologically salient material capitals (e.g. public transport, housing, or waste infrastructures) that enable city dwellers an equality of opportunity for routine sustainable ecological habitus and practice, or changes to social structures and investment in social capitals that support routinised sustainable ecological habitus (e.g. eco-villages, waste reduction programs, tool banks, or environmental social movement organisations), to create compounded change (e.g. Kellogg & Keating, 2011). Additionally, the normative example of sustainable ecological habitus set by authorities would have further radiating effects on wider city society, which could be enhanced through intentional promotion of the same through mainstream or social medias, open access resources, etc.

Finally, within institutional fields, these practices inform a more interdisciplinary structuring of capitals, feeding back to reinforce individual authorities' dispositions, with the cycle continuing in a reflexive (i.e. cyclically progressive) way (Figure 15). Like Bourdieu's conceptualisations, this cycle is both intra-generational, with new practices effecting peers (e.g. disciplinary and institutional colleagues), and intergenerational (i.e. influencing upcoming generations of institutional authorities by example, education, etc.).

These processes would, over time, soften the rigidly-siloed doxa and institutionalise more interdisciplinary doxa and accompanying routine critER. However, for individual and institutional city authorities that became 'change-makers', critER with regards to their leadership practices would be more or less perpetual (i.e. a routinised part of their ecological habitus), enabling their practices to evolve in response to newly emerging socio-ecological challenges, information, solutions and so forth. As discussed herein, this is the mark of a sustainability leader.

8.7 RECOMMENDATIONS FOR FUTURE RESEARCH

As I have demonstrated, ecological habitus, with a Bourdieuan framing can help to describe why certain unsustainable practices like disciplinary silos are reproduced in a given field. It can equally describe more aspirational, 'sustainable ecological habitus', for a given field. Finally, this model can help to conceptualise how to circuit-break an extant cycle of unsustainable ecological habitus and contributing socialised structures (such as siloed city institutions), beginning with everyday

practices (such as collaboration), which in turn can feed into the realisation of new, more ecologically sustainable habitus alternatives.

Correspondingly, I contend that the ecological habitus framework is in itself a valuable tool for generating intentional critER, as it highlights the different components involved, which can then be cogently critiqued. Within city institutions, for example, an ecological habitus framework like the models exemplified here could be applied to critER auditing of policy, design, curriculums, or operations. This could be used to diagnose deficiencies in ecological sustainability and identify the mechanisms (e.g. social structuring of capitals) that reproduce this, and enable identification of strategic changes (initiated through everyday practice) to address these. This has potential to contribute to ecological sustainability in and of city institutions, with outwardly radiating practiced effects on city sustainability as a whole.

8.8 CONCLUSIONS

Gauging collective expert thought to backcast the creation of sustainability in contemporary cities, this research identified collaboration as a practical and strategic starting point in overcoming disciplinary silos of knowledge, practice, and institutional leadership that were seen as a major impediment to increased ecological sustainability. Collaborating with one another and with other stakeholders in city sustainability is one practical way that individual educators, researchers, policy-makers, planners, designers, and other city authorities could begin to overcome the institutionalised doxa of disciplinary silos on an everyday basis. Working alongside those with complementary and even contrary socio-ecological knowledge, perspectives, and practices offers a way to cross disciplinary boundaries, and expand one's sphere of socio-ecological understanding. This understanding can include attaining novel knowledge and skills (i.e. cultural capitals), and, importantly, socio-ecologically relevant understandings (i.e. ecological capitals), which can enhance individuals' capacities for critical ecological reflexivity.

Spending time amongst the alternative ecological habitus of others, be they from different disciplines, institutions, or other divergent societal groups, can enable comparison of ecological habitus, and better reflection on what constitutes ecological habitus of self, of respective disciplines, and of institutions, and how these interact. Additionally, spending time with individuals or groups that are inherently interdisciplinary could provide models and normative support for crossing the disciplinary silos. Thus, certain collaborative practices could potentially enable city authorities to become more aware of the disciplinary silos within their institutions, how these are socially perpetuated, and some potential practical means of beginning to overcome them.

Over time, the interdisciplinarity and critER that deliberate collaboration engenders could be embodied within the ecological habitus of authoritative individuals. Ecological reflexivity, drawing on Bourdieu's conceptualisations, describes and provides for a contextualised and evolving critical reflection upon societies' potential for socio-ecological change; the way social norms are instigated, developed, reproduced, or changed over time; the place of humans within nature; and the significance of sustainability for a desirable future for humanity. According to the experts, these capacities are required for more proactive, innovative, and values based top-down city leadership. If enough authoritative individuals cultivated these qualities, their collective influence would begin to affect the ecological habitus of whole socio-ecological disciplines and city institutions. As transportable and transposable skills, critER and socio-ecologically variants of interdisciplinarity would furthermore move with these individuals, meaning that their influence would spread among leaders' other roles in society (e.g. introducing more sustainable ecological habitus to family, religious, or recreational fields).

Significantly, the intentional practice of critER and embodied dispositions of sustainable ecological habitus would inform city authorities' capital deployment, with a radiating influence on cities via policy, funding, material organisation, and especially the education of upcoming generations of city leaders. Such socio-ecologically informed leadership could create sweeping top-down change to the prevalent and increasingly unsustainable ecological habitus of contemporary Western cities over time. Ideally, it might lead to the instigation, development, and routinisation of more sustainable ecological habitus through example, and by informing, empowering, and otherwise enabling this in the city mainstream. Significantly, any individual could begin to develop such leadership potential with small, practical steps, starting today.

As shown here, a Bourdieuan analysis can conceptually frame research that spans the disciplinary perspectives entailed in sustainable city leadership. In particular, ecological habitus offers an elegant umbrella conceptualisation for understanding socially-structured barriers to sustainability; the roles of powerful agents in deploying ecologically salient capitals; how this impacts cities' education, policy, infrastructure, natural capital, etc.; and ways to create sustainable change through practice. I propose that this could be a useful tool for aspiring sustainable city leaders, particularly as a framework for critER. It could further be applied to assessing silos in the institutions discussed here, such as universities and local government. Finally, it has potential for examining silos more generally, such as the division of cities from nature and environmental organisations from the mainstream; and envisioning practical ways to overcome these. Application of this framework in practice offers interesting scope for future research.

The previous chapter discussed how disciplinary silos in city institutions currently hinder top-down leadership towards sustainable cities, and how collaboration could be a potential first step towards overcoming this barrier. This manuscript was presented before the following two, because it raises the significant issue of disciplinary silos. Silos are also inherent within the following two manuscripts, especially the siloing of people from nature, discussed next, and the siloing of the mainstream of city people from sustainability engagement and practice, discussed later. Additionally, city authorities play an important role in the way that cities are constructed and managed. This idea is developed in the next chapter, which focuses on cities as everyday human environments. It contends that enriching cities with accessible ‘natural capital’, in quantities, and of quality, could support first-hand, everyday experiences of nature, and that this would further contribute to sustainable ecological habitus in city people.

Chapter 9

GROWING SUSTAINABLE ECOLOGICAL HABITUS WITH NATURE IN THE CITY

Abstract

Most cities have unsustainably large ecological footprints and as the most populous human habitats on earth, are correspondingly where mainstream forms of ecological habitus frequently materialise. In Western cities, unsustainable resource consumption is normalised, and people's lives have become abstracted from the ecological systems upon which their existence ultimately depends. To envision how change towards an aspirational, sustainable future might better take hold in Western cities, I interviewed 25 leading experts from a variety of relevant disciplines. Comprehensive and equitable enrichment of cities with 'natural capital' (ecological elements and systems) at a variety of scales and in a diversity of forms was seen as an important part of advancing such change. Accessible, nearby-nature would enhance cities as biophilic living environments, supporting embodied 'ecological capitals' and routinised sustainable practices within city dwellers, while reducing cities' overall ecological footprints. I propose that a Bourdieuan-inspired 'ecological habitus', reinforced by incorporating the concepts of ecological capital and natural capital, provides a comprehensive critical lens for recognising, analysing, and assessing such socio-ecological relationships, and potentially embedding sustainable practices into everyday life in Western cities for the future.

9.1 INTRODUCTION

Sustainability has been a major focus of socio-ecological scholarship for decades. Western cities have often been cast as critical sites in the sustainability transitions that humanity must undertake (e.g. Daly, 1990; McKibben, 1989; Meadows, et al., 2004; Raskin, et al., 2002). Cities in general represent social diversity and innovation (Landry, 2000), and leadership in economics and culture (Sassen, 2011), and are often centres of progressive politics (Barber, 2013). Moreover, many Western cities are becoming centres for leadership in sustainability transitions, boasting biophilic enrichment (Beatley, 2018), green economies (Floater, et al., 2013) and carbon-neutrality (Hamm, 2013). Despite this, wealthy and developed Western countries continue to consistently exceed the limits of natural systems to support their lifestyles (O'Neill, et al., 2018), and the cities within

them have some of the largest per capita ecological footprints worldwide (Ewing, et al., 2010; Rees & Wackernagel, 1996).

More broad-scale changes towards sustainability in Western cities are consequently required, necessitating critical reflection upon, and significant change to, existing unsustainable social paradigms (Ratcliffe, et al., 2006). Working at the level of individuals on a day-to-day scale is seen as one promising way to begin this (Meadows, 1999). At this level, envisioning and creating change necessitates an understanding of how broad-scale socio-ecological paradigms play out through individual everyday practices and then finding concrete ways to challenge and transform these (Brand & Wissen, 2012). Accordingly, Gäbler (2015, p.84) argues that generating “narratives and ideas” for practice is essential for sustainability transitions. In this manuscript I propose one such narrative (in the form of a ‘backcasted’ pathway; Robinson, 1988), presenting an aspirational vision, discussing a barrier to achieving this, and laying out practical steps for overcoming this barrier.

This pathway was developed from my wider research project that explored how more widespread change towards sustainability in Western cities could be generated. It takes a backcasting approach (i.e. a form of alternative forecasting) that is designed for envisioning and accelerating change towards more desirable futures (Ilstedt & Wangel, 2014; Neuvonen, et al., 2014) when conventional forecasts predict undesirable (ecologically unsustainable) outcomes (Dreborg, 1996; Quist, 2007). To generate this data, qualitative exploratory interviews were conducted with 25 interdisciplinary North American experts (e.g. psychologists, designers, philosophers, planners), who provided specialised and experience-informed insight and foresight about creating sustainable future cities (Bogner, et al., 2009).

This manuscript focuses on a key pathway for change in Western cities¹⁰⁴ that I constructed from the interview data. The future aspiration would be for all city dwellers to have sustainable ecological habitus (i.e. a worldview and corresponding practices, capitals, reflexivities etc., which enabled them to think and act with ecological integrity). However, the lack of natural capital in some cities or parts of cities was found from my interviews to be a key barrier to this in the mainstream of city people. This includes a lack of quality (e.g. when natural ecosystems within cities are degraded, or native biota are replaced with introduced species) and lack of quantity (e.g. equitable access to areas of rich natural capital is not provided for all city people). Accordingly, I contend that enriching the biophysical environments of cities with natural capital (qualitatively and quantitatively) is a critical part of sustainability solutions for Western cities. Routine access to quality natural capital could support the development of ecological- awareness, affinity, literacy, identity, democracy, and sustainable practice in city people as parts of routinised sustainable

104. The outcomes of this research emerged from collective and distilled expert responses to interview questions about cities, and I therefore discuss my proposed approach with primary reference to cities. Salience to other fields beyond this is also exemplified.

ecological habitus. Such enrichment would also support the health, wellbeing, and enjoyment of city inhabitants, and provide ecosystem services for cities ‘in house’, which would reduce their (often sprawling) ecological footprints.

As a lens to integrate and frame the interdisciplinary interview data and literatures involved in this pathway, I apply and develop ecological habitus (Smith, 2001), a theory of socio-ecological practice. Ecological habitus describes the evolving, mutually generative constitution of an individual’s ecological dispositions, ecological reflexivity, ecologically relevant practices and capitals, and the social fields that structure and are structured by these. My development of ecological habitus responds to Kasper (2009a) and Gäbler’s (2015) suggestions that the concept be engaged as a socio-ecological change-research tool. I apply it firstly as a neutral descriptor consistent with Bourdieu’s (1972) use of ‘habitus’, enabling assessment of ecological habitus as unsustainable through to sustainable. Secondly, I distinguish ‘sustainable ecological habitus’ as an aspirational alternative whereby ecological capitals, reflexivities, dispositions, practices and fields are routinely sustainable and mutually reinforcing. Based on my research, I also incorporate the significant concepts of (i) ‘ecological capital’, the embodied capitals of ecological-salience that a person holds (e.g. knowledge of natural systems or objects with ecological salience), which are individualised, field-specific, and field-mediated (i.e. socially and ecologically); and (ii) ‘natural capital’, which consists of all non-manufactured biophysical goods and services, and is unique among the capitals of ecological habitus, being communal, universal, enduring, and reproducing autonomously, and yet which is also socio-ecologically dialogic.

I propose that the framework this provides can be critically deployed to assess ecological habitus (e.g. of individuals or social fields) and to envision and enact change towards the aspiration of a sustainable future. Applying this lens, I focus on how sustainable ecological habitus could be materialised in cities as a whole, which is a broader scale than previous ecological habitus scholarship, which has focused on environmental groups, for example, that are disposed towards such ideas as recognising, valuing and acting to protect nature¹⁰⁵ (e.g. Haluza-DeLay, 2008; Kirby, 2017). I assert that enriching city environments with quantities of accessible, equitable, quality natural elements (from street trees to indigenous ecosystems) could facilitate routine, everyday nature experiences and attunements for a boarder spectrum of city inhabitants, ideally beginning in childhood and continuing through every life stage. Such first-hand nature experiences could help to grow sustainable ecological habitus within contemporary Western cities.

105. I use ‘nature’ in a biophysical sense to describe ecosystems and their components.

9.2 METHOD

Method is identical to previous manuscripts – see page 157.

9.3 RESULTS

A central theme of the expert interviews was that creating a future of strong sustainability will require a society-wide (and ultimately global) paradigm shift towards better understandings of humanity's dependency on nature, and more attuned (i.e. sustainable or mutually beneficial) human-nature interactions. The experts emphasised that while it is increasingly well understood the harm people are causing to ecological (non-built) environments, we are less cognizant of the interlinked negative effects that this can have on people. Urbanisation and contemporary ways of life in cities (the most urban of environments) were seen as a critical barrier to the aspiration of routine, equitable, first-hand human-nature connection, with negative consequences.

Unfortunately, the modern city has really turned its back so much on nature. All our great parks were created in an earlier age, for the most part... A lot of the new stuff, you know the so called 'international style' ... where every shopping centre looks like another shopping centre, and there are these big box geometric stores with no windows, and artificial lighting, processed air, and artificial materials... The average office worker in the United States works in a windowless environment. That's new. That didn't used to be the case. *Stephen R. Kellert*¹⁰⁶

There is a kind of environmental sickness that people are experiencing when they are not exposed to green... when they are always in this heavily controlled environment of concrete and asphalt. There is an alienation that happens. *Bruce Morito*

Children today are not connected with nature. And that's not a theoretical issue; it's actually a real health problem for those children, psychologically and in their development... We need a connection to nature; it's how we evolved as a species. And more people are realising that and understanding the problem that kids [who] spend all their time looking at smartphones and computers, they're not connected to the real world. I think there is going to be a backlash against how technology is going to dominate our personal lives, and more parents will be concerned about getting their kids connected to nature... A liveable city of the future will have abundant green space and parks in close proximity to where people live. *David Beach*

106. See Table 4 for list of experts and description of their capacities at time of interview.

9.3.1 Infusing cities with nature: One sustainability solution for cities

Bringing nature into cities and enhancing, celebrating, and showcasing the nature that there is in cities was viewed as fundamental to remedying this ecological malaise. Since cities are where most people live, this was seen as a way to provide ordinary city people with frequent opportunities for potent, affective encounters with nature and to enable them to develop relationships with the natural world. First-hand, physical experiences of nature were seen as critical to a ‘sense of caring’ and motivation to act on behalf of the environment, which expert Susan Clayton highlighted as important parts of environmental literacy (alongside knowledge and awareness).

I think they need to spend time in nature. It doesn’t necessarily have to be out in the middle of the wilderness, but in a city park, or we have Lake Erie here, people spend time at the beach. I think that is probably a necessary pre-condition - just to have a physical experience of spending time in nature. And then it would help if you have important social experiences in that environment as well, so that you get a sense, not just that you enjoy nature, but that the people around you also think nature is important. And then you have some important memories that are in natural surroundings. I think that starts to give you a sense of personal history that’s tied to nature. It’s not something you can really think yourself into; I think you have to have actual experience, although maybe thinking helps. And then you might be able to encourage people to reflect on it, to actually get them to think about it more... There is a lot of research showing that if you ask people, “Where do you like to go, when you need to contemplate life and think about your values?” And they will say that natural settings are the best for doing that. So to remind them of that, and give them the opportunity to do that. *Susan Clayton*

The experts often pointed to the way that nature affects people, and the many co-benefits (e.g. economic, health, and social) to be gained, even by passive association with nearby-nature. This has implications when there is inequity of access to nature (discussed below).

I think we have to basically have a very different attitude about the future, [that] the future belongs with nature as part.... Our ability to learn, our ability to concentrate, our ability to imagine and create, all of those things are enhanced, according to quite a bit of recent research, when people spend more time in connection with the natural world ... and I don’t just mean in wilderness, I mean in cities as well. Nearby-nature is just as important. *Richard Louv*

Rather than being vestigial, that is ... evolved in a context that no longer exists; I argue¹⁰⁷ that our need for nature that enhances our physical and mental fitness and wellbeing continues to be the case today. Taking biophilia into the design of our built and urban world ... is just as important to long-term survival and sustainability as minimising our impacts on the natural environment. This is the reverse of that. It's the impact of the environment on us, and how do we sustain that relationship. *Stephen R. Kellert*

I'm not sure that every interaction with the natural environment has to be reflective contemplation on the meaning of things... They're not necessarily going to get a sense of awe or wonder from walking through a park on the way to work, but I think the benefits of that experience can still be quite substantial... I think there is research that shows that those types of encounters and those types of experiences can result in less stress, more happiness, greater life satisfaction.... Think about what the alternative is, [it's] hard to imagine living life where you didn't have encounters with a tree or a bush or a pond or a bird on a daily basis [but] many people who live in urban environments may have that experience. *P. Wesley Schultz*

The thing about urban green spaces is that people do like to live by them. So if you had a nice park, I think that would benefit the neighbourhood as well. Property would be more valuable there, because people would want to live next to a nice park. People recognise that it is something that they value. *Susan Clayton*

9.3.2 Connectivity of/to nature in cities

Anchoring nature within local cityscapes was also regarded as critical, offering another way to connect people to native biota and local landscapes of the area and heighten day-to-day awareness of localised natural processes. Expert Mia Lehrer emphasised the value to be gained by cities that protect, play up, and utilise their existing landscape features, including use of nature enrichment to enhance these assets, and this was echoed by other experts. Suggested methods for achieving this included layering nature engagement opportunities atop existing biophysical features (e.g. rivers) or man-made features (e.g. Manhattan's linear 'High Line' park, constructed along a disused, elevated freight-rail line), thereby tying nature experiences into the history, geography, geology, or other long-standing features of particular landscapes and places. Enrichment across landscape scales can also combat the fragmentation of ecosystems that is a characteristic of cities, linking existing ecosystem patches into more integrated networks. This can support human engagement too, for example nature corridors can have a variety of recreational uses (e.g. bicycling, play, or commuting). The Calgary river pathway network was highlighted as one example. This expansive

107. In his published works with various colleagues (e.g. Kellert, et al., 2011; Kellert & Wilson, 1993).

series of interconnected pedestrian and bicycle pathways connect Calgary's major rivers, smaller creeks, many parks, and other green spaces. Expert Barbara Deutsch described how people's psychological connection to wider landscapes can also be enhanced by maintaining expansive and undisturbed views from cities to surrounding landscape features (e.g. mountains or the horizon), preventing cities from feeling 'closed in' or 'divided from' natural surrounds. This layering of natural and human elements formed the basis of one expert's design approach:

The landscape [is]... the base, that permanent layer, and then on top of that would be the public realm, and then on top of that sits the buildings, and on top of that sits the different activities, the programs within the buildings, and then on top of that the different ephemeral sort of trends and fashions... [For example] in the early 1900s, [planners]... aligned Banff avenue directly with... [Cascade] mountain, and if it had been off just five degrees it would be a totally different thing¹⁰⁸. But millions of tourists come and stand there and take that exact same picture because of the relationship between the landscape and the public realm, so that makes that place really potent. It seems to me that in society we spend so much time on the trends and fashions, and the things that don't last, the flashy things. *Beverly Sandalack*

Locally specific enrichment was seen as a more tangible way for people to connect with nature and environmental issues, when compared with global issues that can be overwhelming or abstracted from everyday life.

The first step is to get people understanding their bioregion, their place on the planet, and how nature operates there and getting them to care about this place, introducing them, connecting them to it... How do you live here sustainably? What are the most important things to do in your own personal life...? So once you care about this place, then you'll be motivated to live here sustainably. *David Beech*

Mia Lehrer also raised this idea, describing how a sense of awareness and responsibility for yourself and your personal relationship with your local environment can enable more tangible and practical understandings of environmental issues at the day-to-day level, and that this can gradually 'ripple' out to encompass ever-wider communities and even global scale environmental issues. Lehrer exemplified how public contribution to the restoration (i.e. re-naturalisation and daylighting¹⁰⁹) of the Los Angeles River, which runs through the city, might facilitate residents' understandings of 'water' as a tangible entity and that this might grow into understandings of water issues in other places and at more abstract global scales.

108. [A Google image search reveals this 'potent' landscape-human-habitat connection.](#)

109. 'Daylighting' describes opening streams back up to the surface after they have been culverted and piped underground.

Expert Margie Ruddick (and others) discussed how the design of nature enrichment can enhance people's recognition and understanding of local narratives (e.g. using native species or playing off historical or geological features) and processes of change through time (social, ecological, etc.). This can include temporal change and flux, for example creating public spaces that appear different under snow or rain, to call attention to the seasons; or featuring other natural processes (e.g. deciduous leaf falls or spring blossoms). Additionally, nature enrichment overall was seen as a way to counter the homogeneity, sterility, and stasis that characterise some city ecosystems.

Everyday nature, taking a walk in the park, and finding that each and every day reveals something new, and that nature is always stimulating because it's always changing. It's so information rich, it's dynamic, it's uncertain, it's challenging, it's a place where life exists in its greatest flourishing... That has a profound influence. *Stephen R. Kellert*

9.3.3 Quantity and qualities of nature in cities

Increasing the sheer quantity of nature in cities was viewed by experts as a critical factor, with 'percentage green-space' or 'canopy-cover' suggested as potential metrics for evaluating and directing city nature enrichment. Copious tree planting was several experts' favoured option.

Conservation is no longer enough. Now we need to *create* nature, as strange as that sounds, that word 'create'. That's what we are going to have to do. Starting in our own backyards and extending throughout the city and beyond. *Richard Louv*

Just plant as many trees as you can, wherever you can. You have parking lots, or properties, or edges along rivers that aren't being used, even if they belong to a public entity, even if it's on a temporary basis, plant a hundred poplars and call it a day. Just trees, trees, trees. That is, I think, how you can make a huge difference. Taking asphalt out and planting trees ... more is more. *Mia Lehrer*

The low hanging fruit would be street trees. If you could only do one thing, it's get street trees on every street... It seems ridiculously simple, and it is, but they have an enormous number of co-benefits ... providing habitat for little critters, they shade and cool, and significantly reduce urban heat island effects, they make streets safer and much more pedestrian friendly, they sequester carbon, they help to reduce flooding impacts.... Street trees also tend to help screen a safe space, so that aesthetically, and psychologically we perceive the street as a room and a sort of grand space. So aesthetically, they make the public realm feel much much more inviting. *Ellen Dunham-Jones*

Creating a diversity of nature spaces and possible experiences was also advocated, and suggested methods for achieving this included creating community gardens, urban farms and forests, green roofs and stormwater infrastructure, pocket parks, and wildlife habitat and corridors; as well as restoring native vegetation and natural ecosystems (especially hydrological systems, e.g. daylighting streams and riparian revegetation); land-banking greenspace, and regulating minimum levels of greenspace within green/brown-field city development (see Appendix 17 for full list). Even representational and symbolic features of nature in cities were seen as significant.

There needs to be, in terms of ecological theory, large patches, and then corridors, and then fragments... There needs to be a diversity [and] an opportunity for diverse experience. Barbara Deutsch

There are all kinds of ways in which we can experience nature.... If you're in a room that's a box ... that's windowless, no matter how much recyclable material or energy efficiency, you won't want to be in that room for very long. That room is pretty alien ... because it's so disconnected from nature. And so, you know, break that box and start to let in natural light, put in some furnishings with natural materials, put in some décor or coverings that are inspired by natural forms, and all of a sudden you start to feel better again. Stephen R. Kellert

Equitable nature enrichment was another featured issue. Expert Ellen Dunham-Jones discussed how architects often focus on 'raising the bar at the top' by creating iconic and innovative buildings in cities, but that 'raising the bar at the bottom' is really needed to create widespread change. This analogy aptly describes the sentiments expressed by other experts.

Who has access to nature? ... We have a wonderful river valley here [but] there is very little public transit to it... People who are going to use it are going to drive to it... Who's going to go to national parks? Again, people who can drive to national parks, who have the disposable time, and the disposable income to pop out there... Social justice, equity, sustainability: they have to go together... *Randy Haluza-DeLay*

Just because you are working for one group that might have ... more political power, they might have more economic power, etcetera, than the other; you shouldn't do less or think differently... But we actually set that up, so if you have enough money you can actually have a better environment. If you have less money you have a worse environment, and there seems to me that there could be this equity if we just approached everything [e.g. city-wide urban-design and planning] with the same baseline. *Walter J. Hood*

The potential qualities of nature enrichment in cities were also seen to effect the kinds of nature experiences that people might have. Quality design was seen to enable a diversity of nature experiences and enhance equity of nature access and nature's appeal.

In a parking lot you can have a few weeds growing up and a couple of flies or a few spiders and that's a little ecosystem. It's just not very rich and not very satisfying... [Conversely] a good example... is the High Line in New York. It's really interesting, and it probably illustrates how much people like being in nature, because it's packed full of people just walking along a linear path, with nowhere to go to really ... just walking along the path and being in these wonderful environments... The successful public realm elements are ones that are places where you can sit in the sun, just simple, simple things. But if you didn't have a sunny place, then you can't experience the city in the same way. *Beverly Sandalack*

Design elements ... serve multiple purposes but really make people happy to be there ... a lot of times people ... can't really articulate what it is that they like about something, but they just feel good being there.... I call it 'crafting care'... If you design somewhere that ... [suggests,] "we don't want humans to be here we are designing for the car"... those places fall into quick neglect because nobody wants to be there. *Clark Wilson*

Different experts viewed different types of enrichment as preferable, reinforcing the diversity of opinions about nature in cities and the corresponding need for diversity of enrichment. Expert Randy Haluza-DeLay, for example, advocated for wilderness-like nature spaces (while acknowledging that some people may be wary of "wilderness").

We make a distinction between humans and nature, and that's one reason why I think that these little pockets of undeveloped nearby-nature are really important to have scattered throughout our human dominated environments.... Places where ... [kids] can just do whatever they want to do rather than having really organised and structured activities ... where humans don't dominate in quite the same way. A park with mowed lawns is a completely human dominated environment even if it has a lot of trees in it... You can't do the same stuff on a soccer field [that] you can do in a little piece of woods that nobody has developed... Even a two hectare spot ... where you ... walk through and ... might have to scratch your way past a wild rose, maybe there is a wild raspberry plant in there, and somebody might pick some raspberries and say "Wow, this is where our food comes from?" Or just hearing the birds sing differently than the birds that are ... going to be ... [on] a mowed lawn with a couple of ... trees.... [Those] ... birds don't come [in to cities] because it's a desert-land of lawns. *Randy Haluza-DeLay*

Others favoured nature enrichment with transparently urban qualities.

We can use natural processes in our cities; [and] we can mimic these processes ... using landscape elements ... to better our urban environment. But I want them to be urban in nature.... I'm not interested in a babbling brook kind of aesthetic in an urban environment. If we daylight streams let's make them fit within the context of the city and not make them look faux naturalistic. *Clark Wilson*

9.3.4 Childhood and other socialised nature connection

From both personal and professional perspectives, the experts viewed first-hand nature experiences as integral to people's sense of connection to, and perceived value of, nature. For 22 of the 25 (88%), this stemmed from their own formative childhood experiences. Of these, 20 described positive childhood experiences, usually involving unstructured time in nearby "wild" nature, as having inspired their ongoing interest in socio-ecological ideas, positive ecological values, and later career pathways.

Even though I lived in a fairly built-up area, there was a creek running behind my house and an undeveloped lot of land on the back, and then across the road there was a local park that had lots of woods and trails, so I spent a lot of time as a child just wandering around in the woods and swimming in the creek, and I didn't really think about environmental issues for a long time, I just thought, that I liked nature, I liked spending time in it, and then as I became an adult, and started to read more about the real problems we were facing, that's when it occurred to me that this is something I have a position on. *Susan Clayton*

If [you have] any experience as a kid running through the woods chasing butterflies, looking at birds, lying on your back and watching the clouds go by, then when you become an adult I think you really miss that. If someone comes and says, "Hey I've got this notion that we really need to be integrating more ecological infrastructure into the city", then probably as an adult you'll say, "Yeah I really agree with that, because that's healthy. I had that as a kid. I miss it now. I know that my life is less rich, less healthy in many ways." But if someone hasn't had that, then I don't know if you could convince them of its value. *Beverly Sandalack*

In contrast, two experts highlighted socio-ecologically threatening childhood experiences. One was a fatal air-pollution (smog) event in Donora, Pennsylvania in 1948, and the other was the risk posed by mid-century nuclear weapons. These early experiences informed both experts' lifelong dedication to socio-ecological improvement.

I felt threatened by what people were doing.... I was growing up in Santa Fe, near Los Alamos, and in Los Alamos they were building the atomic bombs.... So that loomed large in my life because I had this image of being blown to pieces, nuclear war.... So I grew up with a sense that humans just always screw things up in a dynamic way, and it was a very popular view... So I started thinking through the environmental values, thinking about behaving sensitively to the planet you might say. *Richard Register*

Similarly, several experts also recalled reading ‘Silent Spring’¹¹⁰ in their youths and feeling scared or moved by its revelations, while others emphasised that environmental threats are still acute (and chronic) everyday occurrences for many people worldwide. Additionally, even experts who had positive early experiences in nature described how contrasting experiences later in life had further reinforced their socio-ecological perspectives.

Growing up [I was] in a place I thought was really beautiful, special, [with] interesting geology, interesting animals, beautiful vistas, very clear blue sky... The sky was so clear in New Mexico when I was a kid that you could look out at the western horizon; the stars were bright all the way to the horizon... You don’t see that anymore... There was so little dust in the air, and so little pollution, and so little haze from moisture, things like people watering their lawns, golf courses ... Anyway, I decided that people should really spend some effort trying to defend all those beautiful things. *Richard Register*

Irvine is a ... large city. But everything is planned and scripted. So the houses all look the same, and the whole environment is manicured. There are very few wild places. It’s grass and planned trees. Everything that you experience in Irvine is intended for you to experience. If there is a rock that you are sitting on, it’s because someone planned to place that rock there for you to sit on it. It’s very artificial. So to come from a rural farm town to Irvine and living in this master planned community was just so bizarre. *P. Wesley Schultz*

110. Rachel Carson’s 1962 book ‘Silent Spring’ (1962) brought socio-ecological relationships into sharp focus for modern popular culture, literature, and policy. It presented a scientifically quantified, yet emotive exposé of the far-reaching and insidious environmental impacts of chemical pesticides such as ‘DDT’ that were fuelling the post-war expansion of industrial agriculture. The environmental challenge that this presented for humanity was described by Carson as a “fork of the road”. Choosing to remain upon the “deceptively easy... superhighway” of toxic but economically burgeoning pesticide use, she warned, would ultimately result in environmental disaster (i.e. extinctions, loss of biodiversity, and ecosystem collapse) and accompanying humanistic catastrophe (1962, p.244). However, intentional selection of the opposing “road less travelled”, founded on evidence-based, environmentally-benign solutions (e.g. biocontrol) presented an alternative option - the only option for securing the natural systems that underpin human survival (Carson, 1962, p.244). Carson’s work successfully led to widespread control of DDT, and is credited with spurring the global environmental movement of the late 1960s, and 1970s, as well as stimulating significant political response (e.g. the establishment of the United States Environmental Protection Agency in 1970; USEPA, 2018).

Three experts did not refer to the environment of their childhoods, but described how they reaffirmed their interest in socio-ecological issues through a university project, by interacting with people passionate about the topic, and through an extended cross-country walk, respectively.

I've always been a city boy... I don't think I could point to those kinds of seminal childhoods that a lot of environmentalists talk about, spending whole periods of time at a cottage or a creek or anything, I don't really have that to point to. I can't put a date on it, but at least for most of my adult life I have been aware of a pretty profound disconnect with the natural world and how pervasive that is, both in myself and in those around me. And I just felt oriented to overcoming that in some way, to transcend it... I walked the Camino de Santiago ... between France and the other side of Spain and I had a couple of rather profound experiences there... That really was a bit of a turning point for me to really focus a lot more on this stuff. *Blake Poland*

Additionally, experts highlighted the value of early and ongoing social experiences in nature, exemplifying time spent with family, teachers, spouses, and mentors who supported their experiences in nature and their development of socio-ecological ideas, affinities, etc. Others referred to involvement in social/community initiatives (e.g. permaculture clubs, fruit gleaners, or community gardens).

I think what you need is family, ideally... to take you into these spaces and tell you that, "This is a place we enjoy, this is a place we value". *Susan Clayton*

If people have green space and high quality natural areas accessible, then they'll experience them and learn about them and learn to care for them. They'll develop that attachment. *David Beach*

9.3.5 Nature and the future

A few experts discussed contemporary acknowledgment in Western culture that cities without nature would be impoverished. For example in movies such as *Mad Max*, *the Hunger Games*, *Wall-E*, and *Blade Runner*.

Whenever you see those futuristic movies ... you look to the future of the city and [there are] no trees, no green ... it's like the ultimate representation of good and bad, good and evil, where you have the verdant green environment versus one that is a totally built, anonymous, dangerous city. *Barbara Deutsch*

A couple of experts also disapproved of the "getting *back* to nature" narrative, with its regressive connotations. Instead, they advocated for moving "forward with", or "into" nature. They

considered that this more progressive framing aligns better with contemporary people's expectations and ideals for the future (e.g. technological, moral, material, etc.).

Finally, the coupled conspicuousness of solutions, and failure to realise comprehensive nature enrichment in cities was overtly stated by several experts, and is summed up in this quote:

The interesting thing is you have little pieces of that physical vision embodied in actual built infrastructure all over the world. All the pieces of the eco-city exist. There are a lot of really good pieces out there but they are not united well, people aren't pulling them together into a whole system yet. *Richard Register*

9.4 TOPICAL LITERATURE REVIEW

The purpose of this topical review is to verify and contextualise the interview results within relevant literature in order to enhance the robustness of my discussion further below. Two particular strands of socio-ecological literature are incorporated from ecological economics, which focuses on the quantitative balance of 'natural capital', which cities impact upon and must better contribute to improving; and more inherent nature values, including the need to develop biophilia, within nearby nature, and to overcome bio-phobia and the extinction of experience in order to foster ecological attunement, identity, and values, and sustainable practices in city dwellers. See 5.6.1, which validates this literature review approach, and Appendix 2, which outlines my backcasting epistemology.

9.4.1 Ecological economics

Ecological economics is a relatively young, interdisciplinary field that emerged from the environmental movement, beginning in the late 1960s, to describe the increasing likelihood that Earth's rapidly growing post-war population would outstrip the planet's resources (Ehrlich, 1968), and the political need to mitigate against this risk (e.g. Fuller, 1968; Meadows, et al., 1972; Schumacher, 1973). Environmental issues were correspondingly becoming an international political foci, with the establishment of the United Nations Environment Program in 1972 (UN, 2018), which paved the way for 21st century sustainability responses that continue to draw on ecological economics (e.g. the United Nations Sustainable Development Goals; UN, 2015a; UN, 2015b; and Climate Commission agreements; UN, 2016a).

a) **Natural capital and ecosystem services in cities**

The defining feature of ecological economics is the delineation of ‘natural capital’ (coined by Schumacher, 1973) as part of the global economy that cannot be substituted for human, financial, manufactured, labour, or other forms of capital (Daly, 1990; Ehrlich, 1989). Natural capital is the Earth’s stock of ‘tangible nature’ (e.g. plants, animals, rivers, the atmosphere) and the potential and realised goods that these capitals provide (e.g. sunlight, oxygen, fresh water, food, fertile soil, construction materials, medicines, etc.; Costanza, et al., 2013; Costanza, et al., 1997; Costanza & Daly, 1992). Within cities, examples of natural capital include ‘blue’ areas (i.e. waterways); ‘green’ areas (e.g. parks and gardens); individual and assemblages of plants, animals, and microbes; the atmosphere, water table, soil, and weather (Bolund & Hunhammar, 1999; Gómez-Baggethun & Barton, 2013).

The utilitarian benefits¹¹¹ generated by systems of natural capital are described as ‘ecosystem services’. Costanza, et al. (1997) mainstreamed this idea, proposing the incorporation of ecosystem services into global economics, which built on previous thinking in the same vein (e.g. Daly, 1990; Ehrlich, 1989; Schumacher, 1973). Ecosystem services describe how energy, materials, and information from natural capital contributes to other capitals (financial, cultural, manufactured, etc.), benefiting economic systems and human wellbeing in more or less renewable ways (Costanza, et al., 1997). These services are categorised into ‘sinks’ for pollution (e.g. wetlands that cleanse wastewater) and resource ‘sources’ (e.g. freshwater reservoirs). As recognised in ‘strong sustainability’ (Wheeler, 2013), natural capital must often remain in situ to generate these services, and transforming natural capital into manufactured capital (e.g. bottled water) can diminish its value (e.g. as habitat).

Ecosystem services in cities are pervasive and underpin human survival, comfort, and health, yet often go unnoticed. These include protection and provisioning services, for example, fresh water generation through hydrological cycling; soil formation; nutrient cycling; habitats for biodiversity; food production; pollination (Costanza, et al., 1997); air filtration; noise reduction; rainwater, flood mitigation, and heat island mitigation through permeable surfaces and foliage; and sewerage treatment – terrestrial or aquatic (Bolund & Hunhammar, 1999). Ecosystem services also benefit people at individual scales, for example gut bacteria including those gained through contact with soil (e.g. during gardening), or from other people, etc., are increasingly found to underpin human wellness (e.g. Clemente, et al., 2012).

Natural capital in cities also benefits people’s wellbeing in more widely observable ways, for example providing for educational, spiritual, or recreational experiences (e.g. water sports, hiking, or bird watching; Costanza, et al., 1997). Being in and observing nature have myriad benefits that

111. Natural capital can also have negative effects on people (e.g. via disease vectors or natural disasters) but these are beyond the scope of this review.

have been recognised for decades (e.g. Hartig, et al., 1991; Kaplan, 1984; Ulrich, 1984), including improving people's attention spans, productivity, and physical health, and reducing stress, crime, and violence (see Aldous, 2007; Russell, et al., 2013). In urban green spaces specifically, experiences of nature increase longevity, relaxation, health, and recovery from attention fatigue; and viewing green spaces (e.g. from hospitals, prisons, or offices) increases reported positive emotions, reduces aggression, and hastens recovery (Tzoulas, et al., 2007).

People overall prefer natural environments; however this has not translated into comprehensive nature enrichment within human habitats (Kaplan, et al., 1998). On the contrary, in many contemporary Western cities, manufactured designs and maintenance systems directly replace native species (e.g. with ornamentals, exotics, and domesticated alternatives) and natural environments, and inhibit natural processes (even those that provide ecosystem services). For example, plants and insects are limited by chemical sprays, decomposition is precluded by clearing of organic waste, and local extinction of native insects/birds impedes pollination and seed dispersal of native plants (Alberti, 2005; Andersson, 2006). Remaining ecosystems in cities often have unnatural characteristics such as being small, patchy, and isolated (e.g. divided into residential plots), leading to proliferations of opportunistic/invasive edge-species; while added hard surfaces (e.g. roads and rooves) create hotter micro-climates; and water systems are modified through drainage/reclamation and polluted by litter, sediment, nutrients, and toxins (Grimm, et al., 2008). Even dedicated green spaces in cities are often maintained in resource intensive 'steady states' (e.g. flowerbeds or grass lawns), further contributing to cities' disproportionate ecological footprints (Andersson, 2006).

b) Cities' ecological footprints

In addition to these modifications to natural capital, the concentrations of people, industry, etc., within Western cities, and their advanced development, intensive energy use, and resource consumption also makes them "entropic black holes", typically occupying only 1% of the total space needed by their ecological footprint (Rees, 1997, p.307). 'Ecological footprints' describe the total ecological impacts (e.g. sum of natural capital and ecosystem services) required to provide resources and absorb wastes from a given entity (person, city, etc.,) over time (Rees & Wackernagel, 1996; Wackernagel & Rees, 1998). The heart of sustainability is the idea that humanity's ecological footprint must fit within Earth's long-term provisioning capacity. However, humanity's ecological footprint has exceeded this capacity by more than 50% for decades, continually drawing down on natural capital (Ewing, et al., 2010). High income, industrialised and sprawling cities have disproportionately large per capita ecological footprints (Weisz & Steinberger, 2010), indeed if every human individual lived like the average American, an estimated four Earth's would be needed long-term (Ewing, et al., 2010). Cities' footprints are large because they represent a concentration of people in a relatively small area, who draw

ecosystem services from beyond city boundaries (Ewing, et al., 2010). Accordingly, cities' footprints may be lessened by reducing resource consumption or waste creation and through greater self-reliance. Significantly, as argued here, enhancing natural capital within cities is found to reduce their ecological footprint, for example through the establishment of urban forests (Chen & Jim, 2008), planting of individual trees (McPherson, et al., 2008) and targeted development of ecosystem services (Gómez-Baggethun & Barton, 2013).

c) **Valuing natural capital and ecosystem services in cities**

One factor compounding humanity's ongoing ecological unsustainability is that conventional economics has (and often continues to) exclude or undervalue natural capital and ecosystem services (Costanza, et al., 1997; Schumacher, 1973). However in ecological economics, assigning a calculated monetary value to these aims to enhance recognition and inclusion (e.g. in cost-benefit analyses), ideally promoting their place in mainstream markets and improving their perceived worth and protection. To progress this agenda, the value of the benefits of natural capital and ecosystem services has been modelled, finding that they provide humanity with the equivalent of US\$33 trillion annually on a global scale. This is around 1.8 times the global gross national product (Costanza, et al., 1997). This estimate was viewed as conservative at the time and continually increasing, hence today's figure is likely to be much higher. At a smaller scale, even individual trees in cities can provide measurable benefits (e.g. aesthetic, infrastructural, and through pollution management). For example, trees in Los Angeles have been estimated to provide an average of USD\$38-\$56 of annual benefits, and across five US cities trees were found to generate \$1.37-\$3.09 of returns per dollar spent on management (McPherson, et al., 2008).

9.4.2 **Inherent nature values**

Despite its aim to improve ecological recognition and conservation, the utilitarian premise of ecological economics is criticised as “surface ethics” that focuses too much on nature's anthropocentric benefits (Wilson, 1984, p.126). A counterbalance is ‘deep ecology’ (Naess, 1973), which highlights nature's intrinsic values, following classical environmentalists' moral socio-ecology, ethical environmentalism (e.g. Leopold, 1949; Thoreau, 1854), and ‘land ethics’, which side-line economic value, and reason that people “can be ethical only in relation to something we can see, feel, understand, love or otherwise have faith in” (Leopold, 1949, p.179).

a) **Biophilia**

Wilson's “biophilia” (1984) describes such a love of nature, drawing on interdisciplinary evidence to argue that people have an “innate tendency to focus on life and lifelike processes” (Wilson, 1984, p.1). This develops on earlier, psychological, conceptions of biophilia as a healthy “love of

life” (including love of nature), in contrast with ‘necrophilia’ (i.e. an unhealthy narcissistic disinterest in people or nature, and preoccupation with death and destruction; Fromm, 1964, p.35). The biophilia hypothesis describes how human minds and bodies have co-evolved for millennia alongside the natural world, adapting biologically (including psychologically, intellectually, emotionally, etc.) to natural sensory stimuli, and that modern humans retain this biologically embodied affinity, as evidenced in part by the physical, emotional, and cognitive health benefits gained from nature-connection (Kellert & Wilson, 1993; Wilson, 1984). Such affinity for nature is widely recognised as a key factor in people’s desire to protect it (Gould, 1993; Kellert, 2014; Orr, 2004; Suzuki, 1997; Thomashow, 1996).

b) Extinction of experience

However, contemporary urbanised societies especially are seen to lack the routine, intimate connections with the natural world that are required for biophilia to blossom (Kellert, 2014). Pyle (1978) describes this as an ‘extinction of experience’, which entails a self-reinforcing degradation of human-nature connections. Firstly, physical separation from nature, occurring often because accessible ‘nearby-nature’ (i.e. nearby home, play, and work; Kaplan, 1984) is lacking, precluding people’s first-hand nature experiences. This is most acute in cities, where nature is extensively replaced with more simplified, homogenised, and predictable man-made environments (Suzuki, 1997), and remaining ecosystems are degraded, as described above (Pyle, 2003). Even within nature-enriched cities (exemplified below) nature can be inequitably accessible within people’s routine ‘radius of reach’ (Pyle, 1978). For example, children rely on caregivers to facilitate access, elderly and the disabled may have special accessibility requirements, and the poor may not have transportation to reach nature or resources to incorporate nature at home.

The extinction of experience is perpetuated as this lack of first-hand nature connection precludes intimate understanding of nature and the development of biophilic empathy and affection (Kellert, 2014; Suzuki, 1997), leading to further environmental losses and degradation (Pyle, 1993, 2003). In younger, urban-born generations, the loss of nature experience (due to their radius of reach, the rise of technology, stranger-danger, etc.) inhibits ecological literacy (Kellert, 2014; Louv, 2005; Pyle, 2008), reducing young people’s capacity to recognise local wildlife (Beatley, 2011) or identify places that inspire a love of nature in them (Pyle, 2008).

This disconnection is insidious, for example dulling the space-time dimensions of human-nature connection (Suzuki, 1997). Temporal cycles are manipulated in cities (e.g. using streetlights) and lunar and celestial cycles go unobserved (or are unobservable due to light pollution), while seasonal cycles are concealed by mechanical temperature control and importation of foods out-of-season. Meanwhile, senses of space are blurred by everyday domestic ‘resets’ (e.g. refuse removal that mutes perceptions of how much waste is made and where it goes) while automated travel

presents people from relating closely to local landscapes (Appleyard, 2017). This can diminish senses of temporal responsibility (e.g. intergenerational; Suzuki, 1997) and spatial responsibility (e.g. the ‘Nimby’ effect whereby people more readily accept environmental hazards outside their immediate area; Wheeler, 2013).

c) **Societal bio-phobia**

This is described as resulting in societal ‘bio-phobia’¹¹² (Kellert & Wilson, 1993) or “ecophobia” (Sobel, 1996), which manifests, for example, in disempowerment (Clayton, et al., 2017), a desire to dominate nature (Dutcher, et al., 2007), or a perception that nature is remote or irrelevant (Beatley, 2011; Botkin, 2000). Bio-phobia can describe the current global status quo whereby nature is dominated, exploited, and destroyed (consciously or subconsciously) (Kellert, 2014). Evidence of this is seen in our failure to conserve biodiversity (Clayton, et al., 2017) and vain attempts to solve ecological crises with ‘rational objectivity’ and technology (Orr, 2004). Similarly, ecological illiteracy contributes to environmentally regressive governments and economics (Pyle, 2008).

Orr (2004) describes ‘biophobes’ as “environmental free riders”, relying on others to fight for environmental preservation (Orr, 2004, p.135). The immorality of bio-phobia is compounded when considering the utilitarian losses to health and wellbeing when nature is lost (Kellert, 2014). Significantly, as primarily built environments, cities reflect the “values, ethics, world views and philosophies” held by the societies who construct and live in them (Lake, 2010, p.59), and the disproportionate ecological footprints of Western cities materially evidence that this is more bio-phobic than sustainable at present.

d) **The need for a biophilia revolution**

Accordingly, there are widespread calls for a ‘nature-connection’ (Barnhill, 1999; Berry, 1988; Botkin, 2000; Clayton, et al., 2017; Suzuki, 1997; Thomashow, 1996) or ‘biophilic’ revolution (Kellert, 2014; Kellert, et al., 2011; Kellert & Wilson, 1993; Orr, 2004; Wilson, 1984). Such revolutions rely significantly on everyday nature experiences, and with more than 80% of Westerners living in urbanised areas including cities (UN, 2014), these must become the locations of such routinised biophilic experience. As Beatley (2011) points out, cities and nature are not dichotomous and ‘biophilic cities’ can be created where nature is repaired, restored and “creatively insert[ed]” to provide for day-to-day nature-connection (Beatley, 2011, p.2). Many other similar visions exist, for example in Register’s (2002) holistic vision for ‘ecocities’ that integrate permaculture systems to maximise, generate, and restore natural and human resources;

112. ‘Bio-phobia’ is hyphenated here to visually distinguish this from ‘biophilia’.

and Louv's (2011) vision for cities as 'engines of biodiversity' with similar human and nature co-benefits.

Many cities are already engaged in such change. For example, more than 15 cities have adopted Beatley's (2011) biophilic model including Singapore; Edmonton, Canada; Portland, Oregon; and Wellington, New Zealand, which has established a fringe of pathways around its downtown waterfront to reconnect marine and coastal ecosystems into everyday human habitats, and promote residents' affinity and protection of them (Beatley, 2018). There are also increasing educational and recreational initiatives aimed to increase nature-connection for city children (e.g. CMNH, 2016; Louv, 2016; SPBMERC, 2018; Ward & Pope, 2018), and increasing attention to nature connection in popular culture as a salve for the stresses of 21st century life (e.g. Bogardus, 2015; Bond & Jones, 2013; Louv, 2011, 2016).

e) Nearby nature and ecological/environmental identity

Day-to-day nature experiences facilitate a sense of connectivity, where self and nature are intertwined. This is called 'environmental identity' in psychology (Clayton & Opatow, 2003) and 'ecological identity' in education (Thomashow, 1996). Meaningful and ongoing nature exposure (Berthold-Bond, 2000), including a spectrum of experiences (e.g. comfortable and uncomfortable) and social support to interpret these (Clayton, et al., 2017) help people to develop such identity. In everyday environments, nature can provide for regular, spontaneous, diverse, and immersive multi-sensory experiences, making it real, relatable (Beatley, 2011; Lake, 2010), and emotionally affective. Such experiences stimulate environmental empathy and concern (Dutcher, et al., 2007; Mayer & Frantz, 2004; Schultz, 2000), and biophilia (Kellert, 2003) in ways that cognitive reflection alone cannot (Gould, 1993; Pyle, 2003; Wilson, 1984), and foster ecological literacy in ways that cognitive learning (e.g. reading) alone cannot (Thomashow, 1996). Everyday nature experiences are especially important for children to develop lifelong ecological literacy, identity, and biophilic affinity, and such experiences provide challenges, subtleties, and an organic dynamism that help children's brains to develop (Kellert & Wilson, 1993) in ways that are unattainable from the comfort-control of man-made environments and devices (Kellert, 2003; Louv, 2011; Pyle, 2003; Sebba, 1991).

Once an individual has experiential understanding of and affinity for nature locally this can radiate outwards to encompass other places (Botkin, 2000). 'Bioregionalism' (Berg, 1978; Van Newkirk, 1975) emphasises such place-ties of people's environmental impacts, experiences, and ethics (Berthold-Bond, 2000; Holmes, 2003; Tuan, 1990). This philosophy promotes the re-localisation of economies and corresponding reduction in ecological footprint sizes (e.g. Hopkins, 2008). Moreover, bioregional emphases encourage people to explore the unique ecological features of

their local area, potentially spurring their motivation to protect local places and native species (Beatley, 2011; Thomashow, 2001).

The ‘ecological imagination’ that such nature experiences (and other learning) can contribute to can then also be applied to comprehend more remote, complex, and abstract socio-ecological issues and ideas (Thomashow, 2001), while ecological literacy in general also contributes to building ecological democracy, improving societal socio-ecological relationships as a whole (Morrison, 1995).

9.5 THEORY REVIEW AND DEVELOPMENT

Ecological habitus (reviewed fully in Chapter 2) is an emerging concept that is primarily used to describe the kind of practiced ecological ethic discussed above (Carfagna, et al., 2014; Haluza-DeLay, 2008; Kirby, 2017; Reay, 2004; Smith, 2003). Ecological habitus was coined by Mick Smith (2001) as part of his ongoing scholarship around ecology, place, sociology, and ethics (Smith, 1999, 2011, 2009). He described ecological habitus as a person’s practiced expression of a “heart-felt” sense of connection with the emplaced ecological world (Smith, 2001, p.21) - a synthesis of ethics and practice. I use ‘sustainable ecological habitus’ to differentiate this environmental ethic, and ‘ecological habitus’ as a value neutral descriptor that can equally describe unsustainable socio-ecological dynamics (following Kasper, 2009a). Smith’s conceptualisations, and many others since, draw explicit reference to Bourdieu’s original sociological theory of practice, ‘habitus’ (1972; see Chapter 2 for full review), with varying efforts made to draw ecological parallels to the social fields, individual dispositions, capitals, reflexivities, doxa etc., featured by Bourdieu.

Overall there has been relatively little dedicated theoretical development of ecological habitus or of the analogous ‘eco-habitus’, phrases which are often used in passing. However, ecological habitus has been applied more rigorously to frame several case studies (e.g. of environmental groups; Haluza-DeLay, 2006b, 2008), and is included in scholarship across a variety of disciplines (see Chapter 2). These works focus mainly on social dynamics, practices, education, and distinction (following favoured Bourdieuan lines) within small-scale, delimited social fields, where individuals are largely predisposed to sustainable forms of ecological habitus. However fostering sustainable ecological habitus across broader scales and within the mainstream of people (in addition to those already engaged in the ‘sustainability field’; Gäbler, 2015) is required with ever-more urgency to protect the natural environment and secure a desirable global future.

Kasper (2009a) has proposed that ecological habitus be developed as a socio-ecological assessment tool for better understanding humanity’s current (unsustainable) doxa, and Gäbler

(2015) similarly suggests it as a way to revolutionise what ‘ordinary’ people do in their everyday practices to create socio-ecological transformations on a broad scale. My research develops upon these proposals, arguing that a Bourdieuan conceptualisation of ecological habitus and its components (e.g. fields, dispositions, capitals, practices, reflexivities etc.) and the way that these are produced, reproduced, and changed through time can be applied (with an added lens of ecological imagination) to frame pathways towards socio-ecological change at the more abstract and larger scale of Western cities, where sustainable ecological habitus is yet to become the norm.

Based on my interview outcomes, I focus my discussion specifically on the role of biophysical environments as influencers of ecological habitus in cities. This idea has been touched on in places, but not explored in depth. For example, Smith (2001) describes the significance of embodied and em-‘placed’ connections with nature, and Haluza-DeLay (2008) lists landforms, plants, animals, weather systems, etc., as factors of ecological habitus. Pearson (2015) briefly notes how ecological competency (i.e. acting within nature, for example when swimming) is an acquired and place-based skill. Kasper (2008; 2009b) further notes the supporting role that biophysical infrastructure (e.g. gardens, natural building materials) plays in the lifestyles of eco-villagers. Additionally, habitus (but not ecological habitus) has been described as a bio-psycho-social process (Pickel, 2005), at once emerging from the biology of people as organisms (embedded within material, ecological contexts), the psychology of individuals, and the shared sociological contexts of human life (e.g. familial, economic, religious, historical, etc.).

Adding to these examples, the theories of human-nature connection reviewed above (ecological-economic, biophilia, etc.) affirm that ecological habitus emerges directly (in part) from the biophysical world that provides its life-source. Correspondingly, I contend that explicitly recognising natural capital for this fundamental supporting role (and how it contributes instrumentally to ecologically-salient capitals within people) would fortify ecological habitus as a theory and tool for assessing and analysing socio-ecological dynamics. Bourdieu’s original conceptualisations of habitus omit natural capital, engaging economic language and concepts (e.g. capitals, interests etc.) that have been criticised (in the same way as neoclassical economics; e.g. Costanza, et al., 2007) for being overly anthropocentric (Brondizio, et al., 2009; Grenfell, 2008). Yet natural capital has not been developed as part of ecological habitus scholarship, and I therefore introduce both ‘natural capital’ and ‘ecological capital’ as new components of ecological habitus theory, as a way to interpret and frame my interview results.

9.5.1 Natural capital and ecological capital as core components of ecological habitus

Like Bourdieu’s traditional capitals (social, cultural, economic, and symbolic), natural capital is both affected by people’s practices (in unsustainably negative ways at present) and, as highlighted

above, has considerable and direct effects on people's socio-ecological habitus and lives in general. However, natural capital also has dynamic, fluid, and enduring properties, which I argue differentiate it significantly from other types of capital.

Firstly, it is a communal capital at an interspecies, global, and relatively eternal (albeit constantly evolving) scale. Enriching natural capital can benefit myriad forms of life beyond those who facilitate this. For example, if you plant a tree, other life forms (potentially anywhere in the world) can breathe the oxygen it creates. Secondly, natural capital is persistent, essentially being gifted and inherited intergenerationally and altruistically, due to its independence from people's life stages and generational cycles, to which other capitals (e.g. social connections or financial investments) are often tied. For example, if you planted a tree today, strangers decades into the future might still be gaining benefits from breathing the oxygen that the tree continues to create. Thirdly, natural capital is distinct from other capitals due to this timelessness and independence. For example, cultural capitals such as oral histories and languages can disappear across single generations, and financial investments can 'disappear' overnight. In contrast, natural capital is enduring in pre-, trans-, and post-human ways (Suzuki, 1997) that are not necessarily bound to individual or generations of people or other social units. Thus, if humans stopped investing in natural capital, or even if humans became extinct, nature could largely persist and continue to thrive and reproduce autonomously¹¹³. Even across short time scales, natural capital can self-perpetuate, proliferate, and evolve independently of people. For example, a fertile plant (especially those described as 'weeds') might do this over a period of weeks or months without human intervention (or despite it), given the right environmental conditions. Finally, enriching one kind of natural capital (e.g. planting native species) feeds into and changes a larger web of ecosystems, creating flow-on effects for other forms of natural capital, including humans (Bateson, 1979). For example, creating richer or more diverse biophysical habitats in cities might enable greater invertebrate diversity, which could support pollination and plant reproduction, feed vertebrates (e.g. threatened species), improve human agriculture, and so on.

The second capital I include in my ecological habitus theory is 'ecological capital', which I use to describe any capital with particular socio-ecological salience. This idea converges with Karol and Gale's (2004) 'environmental capital' (part of their 'habitus of sustainability'), but has not been discussed in the ecological habitus literature. I contend that ecological capital can include any/all of Bourdieu's recognised capitals. For example, ecologically sound consumer behaviours, 'green' investments, and solar panels are 'economic' ecological capitals; participation in environmental groups builds 'social' ecological capital; environmental knowledge and skills are 'cultural' ecological capital; and ecological foot-printing analysis or sustainability certification are

113. Biological organisms evolve dynamically in response to environmental conditions, however not all extant organisms would be fit for survival without people's help (e.g. some breeds of domestic pet), additionally, human impacts on many species and their habitats prohibit their autonomous, self-sustaining reproduction (e.g. many of the world's 25,000+ threatened species; IUCN, 2017).

‘symbolic’ ecological capitals. These are examples from the sustainable end of the ecological habitus spectrum, but ecological capital can equally describe unsustainable variants (i.e. those that harness, use, or extract natural capital in unsustainable ways). Ecological capital can be generated via education (e.g. in the form of knowledge or action skills; Karol & Gale, 2004), developed through environmental experiences (Horton, 2006) and physical interactions (e.g. open water swimming skills; Pearson, 2015), intentionally cultivated as a form of symbolic distinction (Carfagna, et al., 2014), or ‘caught’ from the surrounding social field (Haluza-DeLay, 2006a).

Here I postulate that a variety of forms of ecological capital can furthermore be ‘caught’ directly through interaction with natural capital (Costanza & Daly, 1992; Schumacher, 1973). Most directly, ecological capital can (and must) be generated through the embodiment of natural capital (i.e. through incorporation of oxygen, water, and nutrients, etc.). I also argue that natural capital in the everyday city environment can inform sustainable forms of ecological capital in ways that can contribute significantly to the development of sustainable ecological habitus.

Ecological variants of Bourdieu’s capitals and habitus-dialogic alone cannot accurately describe these phenomena. Omitting natural and ecological capitals from ecological habitus leaves only a socially constructed set of dispositions, reflexivities, capitals, and practices that cannot accurately account for ongoing embodiments of the natural world (Cooke, et al., 2016; Karol & Gale, 2004). What is more, describing ecological habitus using Bourdieu’s capitals alone (e.g. symbolic values, cultural understandings, social mediations, and economic support for environmental issues) omits recognition of the tangible ecological effects that people’s practices have (i.e. their ecological footprints).

Without consideration of natural capital, sustainable ecological habitus is not inherently distinguishable from phenomena such as ‘weak sustainability’, where economic capital unfeasibly replaces natural capital; and ‘greenwashing’, where the ecological salience of things is overrepresented (Gäbler, 2015). At the other end of the spectrum, contributing to natural capital can motivate sustainable practices and contribute to people’s ecological capitals. Karol and Gale (2004) for example, assert that ecological sustainability can be (and is) pursued by people for the collective and almost universal benefits that it provides, in contrast to the relatively arbitrary pursuits of material affluence and power that are the focus in much of Western society. Sayer (2005) similarly argues that people’s interests can be emotionally charged (e.g. the pursuit of wellbeing and happiness), and even altruistic or ethically reflexive (rather than exclusively preoccupied with social/cultural distinction as is commonly portrayed).

I correspondingly contend that including natural capital and ecological capitals as components of ecological habitus enable a more robust representation of these socio-ecological fundamentalities. I exemplify this preliminarily below with regards to ecological habitus in cities, but moreover,

propose that it could be applied to a broader scope of research, from analysing specific case studies, including contemporary social-ecological issues (e.g. single-use plastics) through to examination of different social factions (e.g. sustainable practices in schools), etc. Such applications could build on previous case studies (e.g. Haluza-DeLay, 2006a) and theoretical conceptualisations (Kasper, 2009a), potentially applying a qualitative and/or quantitative matrix to assess each element of Bourdieu's formula. This could include the values, attitudes, dominant paradigms or other dispositions of ecological habitus; the mode and degree of ecological reflexivity (subconscious/routine, conscious/periodic, intentional/critical, etc.); the possession or dispossession of key capitals (economic, social, cultural, symbolic, and as argued here: ecological and natural); the constellation of social fields in which ecological habitus emerges and mutually constructs; and the modes of capital deployment within these fields (e.g. conceptual, narrative, action, etc.). Importantly, such analysis might also explore modes of reinforced durability and reproduction of the above factors, and correspondingly, identify potential circuit breakers within extant habitus-dialogics where future change might be initiated.

9.6 DISCUSSION

In this discussion I engage my elaborated ecological habitus framework to conceptualise cities as locations where unsustainable ecological habitus must be understood (to be dismantled), and sustainable ecological habitus created for a desirable future. In particular I consider how enriching cities' biophysical environments to provide 'nearby nature' (Pyle, 1978) could better instil and support the ongoing development of sustainable ecological habitus in a broad spectrum of city dwellers. From my interviews, routine opportunity for first-hand nature experiences was identified as a key aspiration for sustainable future cities. This could facilitate the development of ecologically sound dispositions, reflexivities, and practices over time, conceivably resulting in a routinised and reproduced sustainable ecological habitus among mainstream city societies and would simultaneously reduce cities' ecological footprints by providing ecosystem services 'in house'. A barrier to this was the lack of nearby nature in cities, or parts of cities, of the qualities and quantities required to engage city dwellers and enable and empower them to recognise, seek out, value, or contribute to the sustainability of city and global natural capital. However, having macro- (and even micro-) systems of natural capital within people's everyday city environments was seen as a valuable and practical way to promote nature-as-normal and nature-as-valuable. Significantly, there are many ways to enhance natural capital in cities for this purpose.

9.6.1 'Catching' sustainable ecological habitus from nature in cities

The many biophysical benefits gained from human-nature connection (Aldous, 2007; Kaplan, 1995) imply that people are disposed to a degree of biophilia (Kellert & Wilson, 1993; Wilson,

1984), and correspondingly, that more sustainable ecological habitus might naturally be, ‘caught not taught’ directly from experiences in natural environments (Clayton & Opatow, 2003; Thomashow, 2001), in addition to the recognised influence of social fields (Haluza-DeLay, 2006b; Karol & Gale, 2004). As Bourdieu theorised, the most formative experiences of habitus occur in early life (Bourdieu, 1972) and research has shown that the sensory qualities of childhood nature experiences (alongside parent-child attachment etc.) indeed ingrain these experiences within people’s lifelong schemas, including (but not limited to) their attitudes towards the environment (Clayton & Opatow, 2003; Kempton & Holland, 2003; Sebba, 1991). This was also evidenced in the experts’ descriptions of ‘free range’ immersive play in ‘nearby-nature’ during their childhoods, which disposed them to life-long environmental concerns, and this correlation is further supported by larger studies canvassing thousands of participants (e.g. Wells & Lekies, 2006). Thus, creating more routine opportunities for children to experience nature within cities certainly has potential to kindle sustainable ecological habitus in forthcoming generations (Karol & Gale, 2004; Louv, 2005).

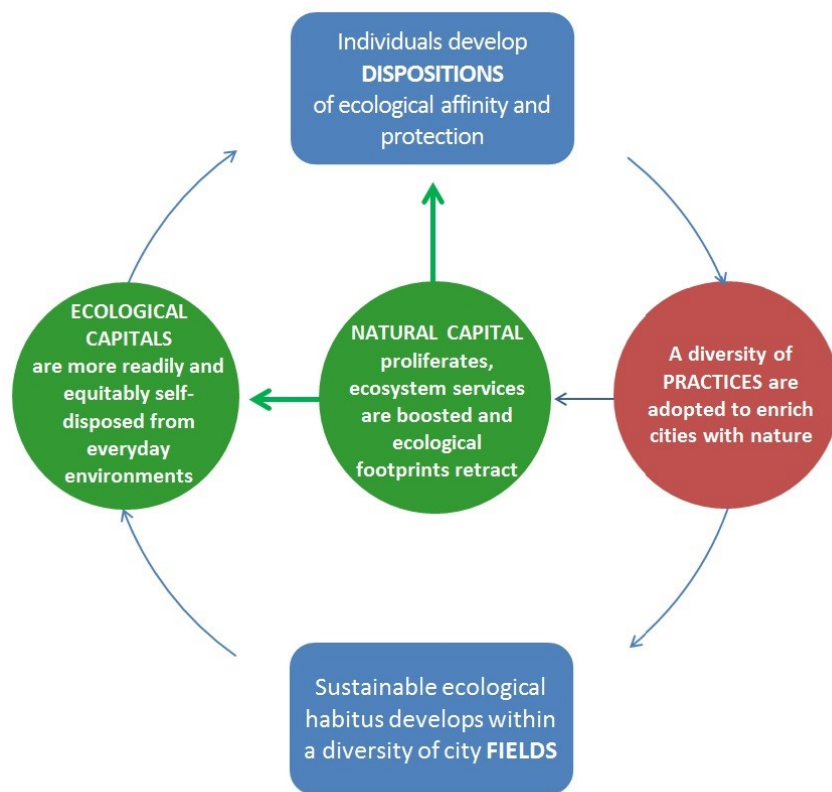


Figure 16: Model showing how enrichment of cities with nature would enhance natural capital and ecosystem services in cities. This would directly contribute to ‘ecological capitals’ and individual dispositions, as well as flowing through the ecological habitus dialogic to influence diverse city fields and ongoing everyday practices; arrows show how each component produces the next.

Adults can also ‘catch’ degrees of sustainable ecological habitus directly from the environment (Figure 16) as opposed (and in addition) to being taught. For example, by spending time in city nature spaces to “self-dispose” (Haluza-DeLay, 2006a, p.112) sustainable ecological habitus (especially if social support for this is lacking) and through applied ecological practices that develop ecological capitals (e.g. gardening) (Cooke, et al., 2016; Horton, 2006; Ingold, 2000; Karol & Gale, 2004). Creating more routine opportunities for city people to connect with nature in these ways could elevate the development of ecological capitals (including recognition and protection of natural capitals), enabling the permeation of biophilic-ease and growth of ecological sustainability as a doxic form of habitus within everyday city life, as modelled in Figure 16.

9.6.2 How to enrich cities with nature

Accordingly, my interview findings emphasised the need for substantial, comprehensive, and equitable increases to nature in cities, favouring a ‘more is more’ approach to ensure routine access within all city dwellers’ ‘radius of reach’ (Pyle, 1978). Substantial enrichment of nature within cities could better enable sustainable ecological habitus to proliferate in the mainstream (dispositionally, routinely, and subconsciously), while enabling city dwellers to benefit justly from the many co-benefits that nature provides, as well as reducing cities’ ecological footprints. However, the benefits of nature enrichment could begin across various scales, ranging from smaller residential gardens or street trees, through to the restoration of wetland, riverine, or other fully functioning ecosystems within cities. Even micro interventions to physical spaces (e.g. pocket parks or nature motifs in the home) were viewed as valuable (particularly for interior environments), facilitating routine and incidental embodied nature experiences. Additionally, strengthening cities’ inbuilt ecological capitals could further enhance the ease with which people could develop and act out sustainable ecological habitus in day-to-day city life (Horton, 2006). Examples include hosting ‘green’ events; enabling green social networking (social capital); and providing resources (e.g. information) and infrastructures (e.g. sustainable transport and energies).

The specific qualities of nature enrichment, including design, usability and safety, were also seen to influence the degree to which people engage with nature in cities, and their ability to benefit from and perceive its value. Creating a diversity of nature experiences was therefore seen as important for facilitating engagement, especially given the culturally diverse populations in many contemporary Western cities. This would necessitate a spectrum of nature opportunities, from wilderness-like nature experiences and large-scale ecologies (e.g. undeveloped ocean beaches), man-made and maintained nature (e.g. botanical gardens), opportunities for interaction with domesticated nature (e.g. growing vegetables), and even the representational and symbolic use of nature, exemplified by interior biophilic design (Kellert, et al., 2011), to cater for different abilities and inclinations.

Nature enrichment with bioregional integrity, and which enhances connectivity to the landscape was also viewed as important. What constitutes ‘sustainable’ ecological habitus is geographically specific, including people’s relations to local landforms, biota, ecosystems, and weather. Thus, recognising, understanding, and protecting biota and landscapes of local significance is a critical part of sustainable ecological habitus.

9.6.3 Who could grow sustainable ecological habitus with nature in the city

Some of the applied means by which cities could become nature enriched (e.g. habitat corridors or regulations on development) require systematic, proactive and innovative city leadership (e.g. governmental, academic, and professional) that recognises ecological values and creates change from the top-down. This could include policies, such as retaining expansive skyscapes and green space in the face of development, or programs, such as developing vegetated recreational networks or restoring local/regional ecosystems and habitat. Participating in such practices could foster further critER in city leaders. Multi-scale (horizontal and vertical) governance could also be engaged in programs, potentially including (and/or uniting) landowners, businesses, community groups, and individuals. Many initiatives could also be initiated exclusively from the grassroots, household, or individual level (e.g. community gardens and orchards, or acts of lawn rebellion). As well as enriching nature in cities, such initiatives could facilitate the development of ecological capital (and eventually sustainable ecological habitus) within participating individuals, who might otherwise be excluded, or exclude themselves from sustainable ecological practices.

The addition of nature within cities might be cause for city dwellers’ heightened ecological reflexivity (a more acute awareness of nature’s presence and people’s interactions with it). Ideally, over time, experiences of nature in cities would become a routine part of people’s habitus, new generations would be imbued with sustainable ecological habitus (and comprising dispositions, reflexivities, and practices), and such cityscapes might be embraced as mainstream doxa. The value of clean air and water, or fertile soil, has historically been taken for granted in the mainstream, and is only recognised in its significance when scarcities become more frequent (e.g. smog, drought, and erosion). Bringing more nature nearby would supersede this precondition of degradation, linking people more closely with their biophilic roots, and making natural and ecologically sustainable capitals something to be pursued in practice, and relevant to their everyday lives. Ideally, this would increase the quantum of people engaged in ecologically regenerative labour (Goodman, 2010) in cities and reduce the unsustainable exploitative alternatives that currently pervade.

If cities became increasingly enriched with nature, and increasing numbers of people developed sustainable ecological habitus (which is arguably inherent and certainly significant to our self-

preservation), what is viewed as normal and acceptable would also evolve. Ideally, more nearby-nature would grow sustainable ecological habitus within city dwellers from childhood and continually dispose people toward it throughout their lifetimes. Nature would be visible, tangible, and normal, disposing people to ecological attunement and practice, and city dwellers may begin to respond pre-reflexively to natural capital through their developing lens of sustainable ecological habitus. Having more nature (and other ecological-sustainability-orientated infrastructures, such as public transport) in cities could enable sustainable ecological habitus to be practiced routinely at the habitual level, within dispositional orientations, through critical reflection and constructive intervention (periodic or sustained), and with doxic ease.

Meanwhile, in contrast, encounters with nature-less cityscapes would seem peculiar or unpleasant, as some experts described happening to them when encountering relatively sterile built-environments that contrasted starkly with the nature-rich environments of their childhoods. Contrasts like this led the experts to express their sustainable ecological habitus through practice, seeking, demanding, and creating environments that live up to and reaffirm the values of sustainable ecological habitus. Sustainable ecological habitus could similarly inform societies' practices (including compounding practices of nature enrichment; Figure 16) as they elaborated upon existing built environments or established new ones. Cities' ecological footprints would contract, or as some experts suggested, ecologies may even regenerate and create net gains to biodiversity, endemic species, regional resilience, or others forms of natural capital. In this way, ecologically enriched cities might grow sustainable ecological habitus amongst city dwellers.

9.7 CONCLUSIONS AND RECOMMENDATIONS

As well as their social, cultural, political, and economic significance, cities are now primarily and increasingly humanity's habitat: our home. As such, they are the places where day-to-day engagement with nature and reconnection to our bio-psychological foundations needs to occur. This research contended that enriching cities with nearby-nature, from street trees to river restoration, and garden plots to wildlife corridors, could enable an equality of first-hand nature experiences and ease of biophilic connection among urbanites. Participating in everyday nature connection and more ecologically-orientated practices might kindle the development of sustainable ecological habitus in the mainstream of city people, including ecologically sound values, understandings, and capitals, and enhanced capacities for critER and sustainable practice, towards a more desirable, ecologically sustainable future.

Sustainability, cities, and ecology are each complex topics with myriad links to one another and beyond. Ecological habitus, as I develop it here, offers a transposable, reassuringly definitive, and straightforward formula, and yet a limitlessly nuanced lens for examining such issues, including

from myriad standpoints beyond the scope of this research. Here I preliminarily experiment with the theory as an analytical lens in abstract terms, yet firmly in correspondence with, and emerging from, the aspirational nature of the experts' visions. This framework has potential value for any individual, institution or society seeking to intentionally develop and embed ecologically sustainable practices, and perhaps eventually habitus and doxa (and to appraise how or why these might become doxic and durable over time [or not]).

Significantly, ecological habitus can be applied to identify barriers to everyday and aspirational change within the complex socio-ecological milieu - including undesirable ecological norms, and also to identify potential and pragmatic ways to strategically 'circuit break' these and instigate change towards more sustainable alternatives. I explored this application to conceptualise how enriching cities with nature could lead to the development of more sustainable ecological habitus in city dwellers. To this end, ecological habitus was valuable for framing the analysis of the interview results and conceptualising the aspirational vision, barriers, and solutions that my research sought to generate.

My addition of 'ecological capital' and biophysical 'natural capital' to ecological habitus strengthens its capacity for such analysis of socio-ecological issues, developing it as a promising framework for assessing and analysing socio-ecological relationships (actual or aspirational), and demonstrating how these are reproduced or changed through time. The various factors of habitus (dispositions, capitals, reflexivities, practices) and Bourdieu's conceptualisations of how these interact can usefully be applied to conceptual framing of socio-ecological issues. Deploying this framework in observational or applied research, such as case studies, ethnographies, or action-research offers a potential means for testing and refining it further. Moreover, engaging the descriptive, analytical, diagnostic, and generative capacities of ecological habitus as part of change-orientated sustainability research (either in a theoretical or methodological capacity) has the potential to generate interesting and environmentally desirable research outcomes. Furthermore, the framework has the flexibility to be applied to research that seeks to bridge disciplines (e.g. ecological, economic, and environmental ethics); consider socio-ecological stasis, hegemony, and change (e.g. from bio-phobic to biophilic norms); examine the role of urban nature in self-disposing ecological capitals; and explore the conscious or subconscious reflexivity between biophysical city environments, ecological habitus, everyday practice, wellbeing, and so forth. The dialogic roles of everyday practice and cities' biophysical environments as building-blocks of sustainable ecological habitus transitions, and the outwardly spiralling effects of changes to these, offer potential for interesting future research.

The previous chapter emphasised the role of cities as human environments and ideal sites for routinised multi-sensory human-nature reconnection, which could provide for sustainable ecological habitus, health, wellbeing, and enjoyment within city dwellers while contributing to vital ecosystem services. This can be contributed to from the top-down, grassroots, and everyday levels by anyone, beginning in the smallest of ways. The next chapter contains the third and final pathway towards sustainable ecological habitus in Western cities that resulted from my research. This discusses additional ways that the mainstream of city society might become better engaged in sustainable ecological practice, and presents an inventory of small ecological actions (SEAs) for facilitating this. I argue that SEAs, which people could undertake with ease in their everyday lives and everyday social fields, could create incremental change and engage a broader spectrum of city people in sustainability.

Chapter 10

SMALL ECOLOGICAL ACTIONS TOWARDS MAINSTREAM SUSTAINABILITY IN CITIES

Abstract

Improved sustainability is an aspiration of many Western cities. One way to pursue this is to increase and diversify the spectrum of people engaged in everyday sustainable practice. Existing approaches to sustainability engagement (e.g. regulatory and green niche), while valid and valued, can be limited in their outreach (e.g. because of technocratic language, polarising politics, or the negative emotions spurred by such overwhelming challenges). Furthermore, sustainable practice may simply seem to be outside of people's 'normal' concerns and everyday routines. This research aimed to generate a backcasted vision for enhancing sustainability in future cities, and to identify pragmatic ways that this could be realised by analysis of interviews with 25 interdisciplinary experts from a variety of socio-ecological and city fields, taking a qualitative, dissensus Delphi visioning approach, and applying a Bourdieuan-inspired lens of ecological habitus. As a result, I argue that small ecological actions (SEAs) are a 'sticky' way to engage more people from mainstream city fields (i.e. those not ordinarily focused on sustainability such as occupational, familial, educational, cultural, sporting, or spiritual fields) in sustainable practice, to complement existing approaches. I constructed an ecological-habitus-based 'SEA inventory' that could empower such city dwellers with a suite of positive, personalised, and practical SEAs to reduce their ecological footprints in concrete ways. This has potential to incrementally shift 'normal' city-based lifestyles towards more sustainable ideals. The motivational inventory process would begin with collaborative identification and celebration of individuals' existing SEAs (e.g. ecologically sound management of food, water, energy, and waste) followed by self-selection of new SEAs for people to experiment with everyday within their accustomed social fields (with initial facilitation where necessary). This has potential to inspire creative adaptation of city dwellers' everyday ecologically sustainable practices and to create widespread SEA-change, thereby contributing to overall sustainable ecological habitus in cities.

10.1 INTRODUCTION

Buckminster Fuller famously described all people as astronauts hurtling along on a spherical SpaceShip Earth (Fuller, 1968), with all the worldly life-supporting systems that we need on board. In the same era, predictions of looming environmental crises began to emerge (Carson, 1962; Ehrlich, 1968; Meadows, et al., 1972), and Fuller described this trajectory as our SpaceShip's "spin-dive towards oblivion" (Fuller, 1968, p.130). Everyone on board is a crewmember McLuhan (1987) later professed; there can be no spectators if we are to stage our collective rescue. Since then, sustainability transitions have only become more urgent, now requiring 'all hands on deck' more than ever.

For decades, collective global practices have drawn down on Earth's ecosystems in unsustainable and irreversible ways (Costanza, et al., 1997). Although there is now significant recognition of the need for sustainability, with almost every country in the world, for example, signing on to the recent Paris climate change agreement (UN, 2016a), this aspiration is nowhere near realised on a global scale (e.g. Daly, 1990; Meadows, et al., 2004; Raskin, et al., 2002; UNEP, 2016). Global consumption and pollution now exceed sustainable levels by around 50%, and this continues to escalate (Ewing, et al., 2010; Wackernagel, et al., 2002). Evidently, this is biophysically impossible to sustain and must be significantly moderated for a desirable future - where the ecosystems that provide for humanity's social and economic wellbeing are protected and secure (Daly, 2005; UNEP, 2016). 'Strong sustainability' describes this biophysical fundamentality, centring on the need to retain Earth's natural capital¹¹⁴ in situ for long-term biophysical provisioning (Brundtland, 1987). Consequently, creating strong sustainability is a key challenge of the 21st century.

Western cities are at the forefront of this challenge. As the main population bases of rich, developed nations (UN, 2014), which have the largest ecological footprints worldwide (i.e. the most negative per capita impacts on natural capital; Ewing, et al., 2010), Western cities represent increasingly intensified loci of unsustainability (Rees & Wackernagel, 1996; Wackernagel & Rees, 1998). However, as transnational centres of politics, economics, logistics etc., and centres of social change and innovation, they are also ideal leaders of innovative sustainability transitions (Barber, 2013; Landry, 2000; Sassen, 2011). Moreover, with their economies and relative social wellbeing established (O'Neill, et al., 2018), such cities are morally obliged to lead global change (McGranahan & Satterthwaite, 2003). Some cities (e.g. Singapore and Stockholm) have already begun (Beatley, 2012; Beatley, 2018; Floater, et al., 2013) and frameworks that can inform such change also abound (Beatley, 2011; Brantz & Dümpelmann, 2011; CCLG, 2017; Hopkins, 2008; Kenworthy, 2006; Leman-Stefanovic, 2012; Register, 2002).

114. 'Natural capital' is the sum of Earth's natural resources and the emergent 'ecosystem services' that these provide (Costanza, et al., 2013; Schumacher, 1973).

However, Western cities are still far from achieving the net ecological sustainability that is desired. In this manuscript, I explore a pragmatic solution to one key barrier in the pursuit of sustainability within Western cities. I use a (somewhat counter-intuitively described) ‘backcasting’ structure of inquiry (Robinson, 1988), to generate an aspirational vision for more sustainable future cities, to identify a current barrier to achieving this, and to generate practical solutions in the present for strategically overcoming this barrier (Dreborg, 1996; Quist, 2007). This is an interventionist alternative to conventional forecasting, which is used to plan responses to ‘wicked problems’ like sustainability when the status quo is foreseen to lead to an undesirable, unsustainable future. This approach is applied increasingly (especially in Europe) to envision and accelerate sustainability (e.g. through changes to transport [Höjer, 1998]; design [Ilstedt & Wangel, 2014]; employment [Köves, et al., 2013]; energy [Lovins, 1976]; lifestyles [Neuvonen, et al., 2014]; planning [Phdungsilp, 2011]; and social structures [Wangel, 2011]). I began with an exploratory, dissensus Delphi approach (Steinert, 2009), interviewing 25 leading North American¹¹⁵ experts (e.g. psychologists, designers, philosophers, planners, landscape architects, economists, sociologists, etc.) to generate evidence-informed and experience-based collective insight that could inform my research question (Bogner, et al., 2009).

These interviews confirmed that creating widespread, substantial change towards sustainable cities will require change from the full spectrum of city dwellers from across all dimensions of society (i.e. every ‘astronaut’ on ‘SpaceShip Earth’). Accordingly, complementing existing approaches (e.g. regulatory and green niche) to increase city dwellers’ sustainability engagement is the ‘future aspiration’ that is core to this manuscript. A critical barrier to achieving this, my analysis concluded, is the inertia maintained by accepted social norms and routinised everyday practices that reproduce unsustainability within people’s everyday lives at the expense of sustainable alternatives, perpetuating the unsustainability of Western cities as a whole¹¹⁶.

To analyse this dilemma from a socio-ecological perspective, and discover how this inertia could potentially be overcome, I expanded and applied ‘ecological habitus’ (Smith, 2001), a Bourdieuan (1972) inspired socio-ecological theory of practice. Applying this as an analytical framework illuminated the intersectionality of capitals, dispositions, social fields, practices, and reflexivities that inform people’s ‘logics of practice’ with reference to sustainability in cities, how these are reproduced through time, and importantly, how they might be intentionally changed (Bourdieu, 1990b; Bourdieu & Passeron, 1977). As an outcome, I propose a preliminary ecological habitus based inventory for assessing and enhancing sustainability through SEAs. This develops on

115. North America represents some of the highest per capita ecological footprints worldwide (Ewing, et al., 2010), placing experts there at the coalface of sustainability-transition research, and the density of expertise there also enabled generation of a diverse quantum of relevant insight within the project constraints.

116. These outcomes were based on my analysis of the interview results regarding sustainability in cities specifically, and I therefore orientate my discussions to cities, although there is salience for sustainability in other places.

Kasper's (2009a) model, and has potential to make sustainable ecological habitus more 'sticky' for a greater diversity of city people.

"Sticky" sustainability engagement, drawing on Gladwell's¹¹⁷ (2000) concept of 'stickiness', would make sustainability more readily understood and accepted by ordinary people, better retained as ideas and in practice over time (both consciously and subconsciously), and more readily enacted when appropriate.

I contend that small, everyday changes that are positive, practical, and personalised could provide a set of 'first steps' for incrementally improving the stickiness of sustainability in these mainstream city fields. In this context, I use 'mainstream fields' to describe groups, institutions, etc., that are not ordinarily focused on sustainability and may not actively pursue it, but may incidentally practice aspects of it. Examples include occupational, familial, educational, cultural, sporting, or spiritual fields. If routinised (and ideally embodied as capitals, dispositions, and growing critical reflexivity) over time, this could contribute to sustainable ecological habitus in cities overall, and provide another method of sustainability engagement to complement existing approaches.

The SEA inventory approach that I propose differs from other common approaches by commencing with an inventory of people's existing SEAs, to recognise and celebrate existing progress, and occurs within familiar social fields that individuals value and act competently within. SEA change could potentially be kindled here by respected 'leaders' or 'influencers' in the field (potentially with guidance from informed or expert agents as required) to increase its stickiness. Change through SEAs could begin with food, water, and energy consumption; waste generation and disposal; finance; conservation and first-hand experiences with nature; growth of people's ecological capitals (e.g. understandings and skills); recruitment for or engagement with sustainability social networks, etc.

After people's existing practices, interests, values, limitations etc., are mapped out, the inventory process could facilitate self-identification of additional positive, personalised, and practical SEAs for people to experiment with anew. Starting with such small-scale and field-specific steps, especially those that garner excitement (e.g. perhaps sharing sustainably sourced foods or participating in cute-wildlife conservation), could immediately contribute to sustainability, lessening people's ecological footprint from the outset. Furthermore, grown and compounded over time across many people, SEAs could inform, inspire, and empower sustainable ways of life across a diverse range of mainstream city fields that might otherwise continue with unsustainable 'business as usual'. This would complement engagement generated by existing approaches. Thus, SEAs would ideally

117. Some of Gladwell's conceptualisations of human social life align with Bourdieu's 'habitus'. For example, Gladwell describes human character as being "like a bundle of habits, tendencies, and interests, loosely bound together and dependant on circumstance and context" and considers that fundamental and persistent change (of belief and behaviour) necessitates a community where these can be practiced, expressed, and nurtured (Gladwell, 2000, p.173).

encourage and enable a broader spectrum of city dwellers to engage with sustainability by starting small, and contribute to the increasingly urgent need for widespread sustainability transitions in Western cities.

10.2 METHOD

Method is identical to previous manuscripts – see page 157.

10.3 RESULTS

My interview analysis unsurprisingly found that widespread change is needed for ecological sustainability to become established within future Western cities, and that this needs to occur across a range of societal levels and address the many different dimensions of socio-ecological relationships. A collective aspiration expressed by the experts was that a fuller-spectrum of city dwellers would ideally become engaged in creating sustainability. Below, as part of my backcasting approach, I discuss people's perceptions of 'normal' as a key barrier to realising this aspiration and potential ways to begin overcoming this.

The 'normality' of unsustainable ways of life within mainstream city fields, where unsustainable practices go unquestioned and are considered to be 'just the way things are', was a particular barrier to increased sustainability engagement that was discussed repeatedly and emphatically within the interviews.

The most important thing is just what people learn to accept as normal... In some countries, it's very, very common to walk all over the place or to ride your bicycle all over the place - even if it's raining, even if it's a long way. People just take it for granted because that's what they do. But in this country [USA] we learn that we drive our cars everywhere and we just take it for granted, that's what we do.... It's not that the people who are walking in the UK or riding their bikes in the Netherlands are necessarily more pro-environmental than the people who are driving in the U.S.; it's just what they expect to do, and what they see everybody else doing. *Susan Clayton*¹¹⁸

This sense of what *is* 'normal', and correspondingly, what is perceived to be outside the norm of people's everyday lives, was viewed by some experts to perpetuate disengagement of mainstream factions from existing sustainability approaches, and prevent broader sustainable change. Things outside 'the norm' included ideas and issues that people perceive as irrelevant or abstracted from

118. See Table 4 for list of experts and description of their capacities at time of interview.

their everyday life, activities beyond people's capacities (in terms of their knowledge, skills, finance, infrastructures, location, recreational time, etc.) or divergent from their routines, or simply things that were perceived to occur within 'other' people's lives or within 'other' groups (e.g. political, socio-economic, demographic, etc.) that have more explicitly socio-ecological foci.

You have to be seen as an expert, or know what you are doing, or have some sense that what you are going to do is going to make a difference, before you even get up off the couch... We have a lot of cultural assumptions, in the West, about what it means to get involved in stuff, and most of it, if you unpack it carefully, seems almost exquisitely designed to keep people from doing anything. *Blake Poland*

A lot of these things are seen as things that highly educated elites do - liberals. So it's liberal to ride a bike, or liberal to eat organic food, and I think that's a problem. Because if we have a culture clash which takes a political form, then the people in the red [states]¹¹⁹ may resist these things, because "that's what 'liberals' do". *Juliet Shor*

In addition to perceptions of exclusivity, irrelevance, or opposition to sustainability, the negative messages surrounding sustainability, including those presented by existing sustainability agents/organisations, were also viewed as potentially off-putting (and counter-productive even for established environmentalists). Several experts also expressed displeasure at the 'loss-orientated' tone of sustainability discourse. For example, the phrase 'getting *back* to nature', which may be perceived to suggest a loss of progress or development (economic, technological, material, etc.). One expert suggested the alternative phrase "moving forward 'with' nature" (i.e. depicting a mutually enriching experience for people and nature). More positive counter-messages were viewed in general as important as a way to attract people to participate in sustainability initially, and to make the experience of participants more enjoyable and life-affirming overall.

I think the environmental movement needs to do a better job leading people to a positive future and creating pictures of that so people understand what it can be like, instead of just fighting the bad stuff. Environmentalists are really good about protesting bad things, fighting the polluters, but we need to spend as much time trying to do things that are better alternatives. If you pay attention to the scientific literature about climate change today ... it's really depressing. It's happening faster than predicted, it could be even more devastating than people feared, and instead of dealing with the problem we're actually accelerating the problem. *David Beach*

To better engage a variety of people in sustainability, expert Stephen Kellert suggested that the sustainability movement work with people's sense of normality, to "recognise the world that we

119. I.e. political conservatives.

live in and proceed from there, rather than saying, “we should all do something fundamentally different”. Many experts echoed this, discussing how changes to everyday practice and people’s ordinary activities, as well as positive, tangible sustainable examples, are both promising ways to begin. Food, for example, was seen by several experts as a compelling and appealing everyday lifestyle factor for most people, as it is a universal part of ordinary life, and something enjoyable, social, and practical for people to begin with (e.g. perhaps via sustainable food workshops). This contrasts with the complex concepts that underpin sustainability (e.g. climate thresholds) that can seem very abstract. More tangible dimensions of sustainability were seen as more accessible entry-points for learning and change.

People pay attention to ‘stuff’ and ‘too much stuff’. It’s a more immediate way into the conversation for many people. If I tell them that they use ‘x’ number of gallons of fossil fuels... they are not that interested. If I tell them that on average Americans consumed (purchased) 70 new pieces of clothing last year, they are horrified¹²⁰. *Juliet Schor*

Some existing green niches already focus on tangible everyday change. For example, in his interview, expert Blake Poland discussed his local Transition Town movement, which had been running very popular pickling and canning workshops for preserving food. He attributed part of the organisation’s success to their ethos of positivity. “If it’s not fun, it’s not sustainable”, is how he described their informal motto, remarking that this encouraged new people to participate.

People are attracted to that more positive element... we see a lot of people getting involved who haven’t been involved in other environmental initiatives. *Blake Poland*

Highlighting how sustainable practices can be incorporated into people’s everyday lives and align with their routine norms and deeply held values was seen as an effective way to demonstrate the universal relevance of sustainability and encourage engagement. For example, the desire for a better life, especially for people’s children and families, was viewed as a near-universal human goal, and demonstrating how ecological sustainability could collectively contribute to this, beginning with action in the present, could be a way to motivate sustainable practice. Suggested modes of practice included facilitating better understanding of socio-ecological issues, creating enabling social/material contexts, leading by example, and/or promoting self-contemplation of deep values.

All people, especially young people, want to create, they want to be creative, they want to innovate, they want a world that is more than the world which they inherited... We have to demonstrate to people, in the context of their everyday life that a benign and

120. See Schor’s books *Plenitude* (2010) and *Born to Buy* (2014).

beneficial relationship to nature is in their self-interest. You know when I talk about health, productivity, fitness - physically, mentally, spiritually - that's something that we all aspire to achieve.... If people see that their children have greater prospects to live a richer - in the broader sense of the word - and rewarding life, and have a chance of achieving a measure of happiness and fulfilment ... then they are motivated in a different sort of a way, and that to me is where we need to focus. *Stephen R. Kellert*

The overwhelming response of the experts, when asked if it is possible for such widespread change to occur, was, “Yes”, and many historical cases were exemplified (e.g. civil rights and peace movements, smoking reduction, and seatbelt uptake), as well as examples of current leadership in sustainability transitions (e.g. aspects of Scandinavian countries). In the absence of radical revolution or collapse, the experts viewed societal change to be something that is often slow to occur, but can be increased incrementally and compounded over time and space. Expert Richard Louv exemplified the nature clubs that have sprung up across the United States as a result of work advocating the benefits (mental, physical, emotional, and social) of nature for children (e.g. Louv, 2005, 2011, 2016).

These are groups of several families that [might visit a] park on Saturday and take a walk, take their kids, go for a hike up in a stream reservation or plant native plants in their neighbourhood or in their back yard. *Richard Louv*

The clubs promote “self-replicating social change”, he said, beginning at a small and accessible scale (e.g. one family downloading a ‘tool kit’ of practical activities; see CNN, 2016) with the potential to grow into larger movements (e.g. in less than a decade more than 35,000 families have joined the clubs). Moreover, by working with children, the clubs contribute to “building a new constituency for environment, for a better kind of city ... for environmental literacy”, Louv said. However, he also considered that more tools need to be developed to compound people’s sustainability engagement, and other experts echoed the need for plurality and diversity of sustainability approaches.

Unless we have 50 or 100 additional tools that are similar to that, we won’t have a constituency. Even if the politicians show up, and want to propose a policy that we like, unless they have a political constituency that has been built, a network, they won’t get very far. *Richard Louv*

I think it’s one of those notions, you know, ‘Let a thousand flowers bloom’. We all need to be discovering what our gifts are, and what we can contribute to this transition.... There is so much to be done, and we waste too much time debating, ‘what’s the best way to do things?’ Everybody is drawn to contribute in a different

way, and that all matters... I think we are at a point in history where we need all hands on deck. *Blake Poland*

I conclude these results with a final quote from Stephen Kellert, who, like many of the experts believed that a sustainable future is possible if we begin to make appropriate change in the present. He asserted that, under the right conditions, such change could rapidly permeate the populace and become an accepted part of the city mainstream.

Values can change and they can change more rapidly than people think ... it's amazing how fast things can change, once ... you get up to a certain critical threshold ... We are kind of a herd animal, you get to a certain point and you find that all of a sudden the herd is moving in a different direction. *Stephen R. Kellert*

10.4 TOPICAL LITERATURE REVIEW

The purpose of this topical review is to verify and contextualise the interview results within relevant literature in order to enhance the robustness of the discussion section, further below. Existing approaches to sustainability engagement, limitations of these, and ways to make sustainability engagement 'stickier' are included. See 5.6.1, which validates this literature review approach, and Appendix 2 that outlines my epistemology of backcasting, which this review aims to fortify.

10.4.1 Existing approaches to sustainability

There are substantial existing efforts to engage people in sustainability and one way to broadly categorise these is into 'top-down' structural approaches (effecting macro-scale city economics, materialities, politics, etc.) and 'side-ways' or 'bottom-up approaches' (formalised/institutionalised or 'grass-roots'). Transnational top-down examples include the Paris agreement, and United Nations' integrated 'Sustainability Goals', which aim to reduce per capita environmental impacts in cities (UN, 2015a, 2015b), and have attracted broad symbolic engagement. At the national level, top-down approaches can harness resources (e.g. tax bases) to create broad-scale sustainable change (Barber, 2013) through sustainable financing, technologies (Floater, et al., 2013) research (Brown, et al., 2015), education (Fien, 1993), infrastructure, city zoning and form (Beatley, 2012; Jacobs & Alexander, 2006), and ecological enrichment such as green-scaping (Beatley, 2011). These can effectively promote and enable sustainable behaviours (Steg & Vlek, 2009). Top-down policies within non-governmental organisations can also showcase sustainability leadership, for example, 'green' university campuses (e.g. OSU, 2017); carbon-neutral buildings (Kibert, 2016), religious institutions (Hamm, 2013), and public events

(Roper, 2006); and hospitals and schools committed to biophilic design to reduce resource use and improve socio-ecological outcomes (Kellert, et al., 2011).

Bottom-up and sideways approaches to sustainability engagement can be described as “green niches” (these are fields of society where sustainable thought, action, and critical solutions are sought-after, widespread, and supported by social learning; Seyfang & Smith, 2007, p.589). These niches complement and can overlap with top-down approaches, providing social and humanistic qualities (e.g. stories, experiences, and friends), that policies, theories, and other abstract or technocratic approaches can lack (Harré, 2011). Because of their concentrated natures, green niches are often wellsprings of sustainability innovation and problem-solving, and their capacity for holistic solutions in particular is often unavailable through top-down approaches (Seyfang & Smith, 2007), which can be overly siloed (see Chapter 8). Green niches can include globalised environmental organisations (e.g. Greenpeace), grassroots community transformations (e.g. ‘incredible edibles’; IETCT, 2016); activism (Beavan, 2009); eco-villages (Kellogg & Keating, 2011); nature clubs (Louv, 2011); cooperatives and farmers markets; and fields of impassioned individuals such as artists, musicians, and film makers (Morrison, 1995). These groups provide participants and the public with information about environmental issues, people’s roles in these, and effective ways to make improvements (Steg & Vlek, 2009); as well as ‘sideways’ social support, sharing of ideas (Perlman & Hopkins, 1998; Seyfang & Smith, 2007), and everyday opportunities for socialised sustainable practice (Haluza-DeLay, 2006b; Horton, 2006). They can also unite (potentially marginalised) factions, generating bottom-up pressure to influence top-down decision makers (Bullard & Johnson, 2000).

10.4.2 Limitations to sustainability engagement

While valid and valued, characteristics of both top-down and bottom-up approaches can be limiting to widespread engagement with city dwellers. From the top-down, the bureaucratic, slow pace of change and fraught institutional politics (e.g. governance that appears discouragingly short-sighted or self-interested; Ratcliffe, et al., 2006) can deter people. They can also be alienated by overly technocratic language (Fischer, 2001) and policies that are out of touch with people’s everyday lives (Gäbler, 2015), local needs (Blake, 1999), or conditions in local biophysical environments (Fischer, 2001). In addition, overtly politicised sustainability approaches or groups can polarise and potentially exclude people with alternative political views (Antonio & Brulle, 2011). Without establishing ecological democracy¹²¹ (Hester, 2006; Morrison, 1995), top-down approaches can also be inaccessible to the average person (i.e. with reference to their skills and understandings). The power hierarchy of top-down approaches particularly can reinforce inaccessibility if concerns of ecological sovereignty (Smith, 2011), ecological injustice

121. Ecological democracy describes equitable inclusion of all people as socio-ecological actors and decision makers.

(Plumwood, 1993; Schlosberg, 2009); and ecological inequality (Hester, 2006; Pellow & Brulle, 2005; Pyle, 1978), are not systemically accommodated, as these undermine both ecological democracy and agency (Morrison, 1995).

Green niche approaches can also be limiting to mainstreamers. For example, more ‘hard core’ ecological groups can be (or appear to be) “smug”, “superior” and self-contained (Harré, 2011, p.86), or exclusive to committed environmentalists with well-formed ecological agendas (Horton, 2006), thus limiting their accessibility (actual or perceived) (Harré, 2011). The critical ecological reflexivity¹²² that defines and is promoted by many environmental groups (Crossley, 2003; Haluza-DeLay, 2008) can also be confrontational (Allen, et al., 2017) potentially deterring mainstream participation.

Furthermore, both top-down and green niche approaches can reinforce overly negative cultural narratives (Ilstedt & Wangel, 2014), for example through shocking environmental campaign advertisements or negative depictions of environmentally disengaged people (e.g. as “free riders”; Orr, 2004, p.135). This can alienate people and be self-defeating if perceived as threatening or disciplinary (Nagel, 2005), or if they trigger negative emotions that people avoid, such as shame, anger (towards self, or others; Harré, 2011), fear, despair, guilt (Lappe, 2011), and solastalgic¹²³ grief (Albrecht, 2005). Additionally, the routine repetition of these narratives (e.g. through film and television) can make undesirable future outcomes seem inevitable (Harré, 2011), resulting in a sense of powerlessness (Albrecht, 2005), hopelessness (Nagel, 2005), and/or apathy (Barnhill, 1999). Similarly, if options for sustainable change (e.g. reducing consumption) and sustainable societies in general are presented in ways that people find unattractive (e.g. requiring reduction in comfort or quality of life, or being perceived as boring, uniform, or dictatorial) this can alienate people (Meadows, et al., 2004; Orr, 2004), further reducing the normative reproduction of sustainability in mainstream social fields and overall (Harré, 2011).

Finally, even people who identify with or participate in green niches can be limited in their everyday practice by ‘situational factors’, leading to ‘attitude-behaviour’ or ‘value-action’ gaps (Kollmuss & Agyeman, 2002). Situational factors are often mediated from the top-down, and may include, for example, a lack of access to sustainability infrastructures (e.g. without public transport, people may tend to drive more; Hester, 2006), sustainable domestic resources (e.g. water-saving shower fittings; Southerton, et al., 2004), and/or nearby-nature, which can inhibit the enactment of sustainable aspirations (Pyle, 1978).

122. I.e. intentional scrutiny of the socio-ecological dimensions of one’s own life, or that of others, and corresponding change as a response to this.

123. Solastalgia is the distress or grief felt when one’s (home) environment is changing and/or under threat.

10.4.3 How can sustainability become stickier?

Increasing sustainability engagement beyond established approaches would benefit from complementary alternatives that are ‘stickier’ for the mainstream of city people. There is an abundance of interdisciplinary literature discussing how sustainability can become stickier and what motivates sustainable practice (e.g. everyday activities and norms, sense of agency and responsibility, education, identity, values, goals, worldviews, place attachment, childhood experience, proximal environmental hazards, age, gender, culture, ethnicity, etc.; Gifford & Nilsson, 2014). However, I focus this review specifically on the roles of positive communications framing, everyday norms, and self-determined incremental change, as three sticky ways to encourage sustainability engagement that resulted from my interview analysis.

Firstly, positive framing of ideas, messages, campaigns, activities, programs etc., and creating positive experiences (Harré, 2011) or at least matching negatives with positives (White, et al., 2011) results in more positive judgement and evaluation of issues, creating positive shifts in participants’ valence (i.e. spectrum of emotions) towards joy, for example (Levin, et al., 1998). Importantly, such positive experiences can translate into people choosing sustainable behaviours (e.g. in relation to climate change; Morton, et al., 2011; and energy consumption; Van de Velde, et al., 2010). Bio-psychologically, people are attracted to positive emotions; desire growth (emotionally, intellectually, etc.) and approval (Harré, 2011); and seek to meet other nonmaterial needs (e.g. respect, variety, interest, community, joy; Meadows, et al., 2004). Experiences and messages that trigger these feelings appeal to people and encourage routinisation (Harré, 2011). Furthermore, positive emotions and a sense of being valued and included encourage curiosity, creativity, cooperation, and improve people’s openness to change (Harré, 2011), thereby acting as potential antidotes to negative narratives, and making sustainable ideas, practices, and engagement more attractive and seemingly achievable.

In practice, such positivity can be included in sustainability practice and messages. Practices can be designed to provide people with tangible, immediate, and affective positive feedback including social approval (e.g. via positive affirmations) or sensory stimulation (e.g. conservation activities involving ‘cute’ animals or tasting delicious sustainable foods; Harré, 2011). Positive messages can create new narratives around people’s everyday activities (Eckstein & Throgmorton, 2003) or suggest aspirational visions of potential sustainable futures (e.g. constructed through workshops or delivered via visual or other medias) which can change what people perceive as possible for them or their future, including their agency to change this through action (Dreborg, 1996; Ilstedt & Wangel, 2014; Quist, 2007). Messages can be designed to highlight the positives of sustainability approaches such as dynamism, diversity, interest-value, and improvements to quality of life (Meadows, et al., 2004). Messages linking people’s wellbeing to environmental wellbeing (e.g. highlighting ecosystem services) can furthermore encourage internalisation of the perceived benefits of sustainable behaviour, increasing its stickiness (Clayton & Opatow, 2003).

Tailoring such experiences and messages to people's specific needs, wants, values, practices, and worldviews etc., which factor into sustainability behaviours, can also make them stickier (Steg & Vlek, 2009). This can include highlighting the benefits that people could gain, such as individual happiness and wellbeing gained from nature engagement (Louv, 2011), competitive advantages from sustainable business practice (Hockerts, 2001), situational benefits (e.g. saving money by saving electricity; Hines, et al., 1987), and synergy with deeply held values (e.g. reducing resource consumption, and thus required work hours, to increase quality family-time; Meadows, et al., 2004; Schor, 2010). Even when sustainable change requires sacrifice (e.g. reduced material consumption; Hall, 2013), positive moral framing can motivate sustainable behaviour (Steg & Vlek, 2009), as people generally seek to be moral. Thus, morally palatable or inspiring messages (e.g. 'collecting this plastic litter could help to protect wildlife') and experiences are also more sticky (Harré, 2011).

Another aspect of positive communication is to focus on what people already do that is sustainable, ideally 'normalising' sustainability engagement through perception-change. This can be further supported through positive role modelling (Steg & Vlek, 2009), but can be undermined by comparisons between people (e.g. resulting in reduced action if people consider themselves to be doing more than the average; Harré, 2011). Thus, positive affirmation of people's recognised (and unrecognised) contributions to sustainability is a constructive option for fostering positive emotions and contributing to people's basic needs (e.g. respect, recognition, belonging; Harré, 2011).

The second dimension for creating sticky sustainability that I review is the realm of everyday life. This is a promising locale for accessible, achievable starting points for sustainable practice, towards broader, societal transformation (Brand & Wissen, 2012; Gäbler, 2015; Meadows, 1999; Whitehead, 2009). Everyday environments (social and material) are universally experienced, meaning everyone has some potential to understand, communicate about, and imagine them as changeable (Whitehead, 2009, p.666). They are also familiar and comparatively non-threatening sites for experimenting with change (Mann & Smith, 2011). Furthermore, everyday practices in the present inform what people see as possibilities for their future, so change here can lead to broader changes in perceived trajectory (Ilstedt & Wangel, 2014). Finally, everyday life is place-embedded, enabling place-based learning and practice, which is argued to be necessary for sustainability (Gorobets, 2005; Haluza-DeLay, 2006a).

The many and varied practices of everyday life can thus be seen as latent starting points for wider socio-ecological transformation (Brand & Wissen, 2012). Significantly, this abundance of options means that starting points can be selected in accordance to a person's specific needs and wants and the specific barriers they face. Small, convenient change (in terms of time and effort) within people's existing capacities (e.g. in terms of finance, skills, and infrastructure) is more likely to be started and

maintained (Steg & Vlek, 2009), and “cobbling together” a variety of such changes can thereby incrementally enhance the sustainability of people’s lifestyles (Lorenzen, 2012, p.1) without the need for new resources or the overwhelm of setting an endgoal (Mann & Smith, 2011). Additionally, testing new practices (and plans, actions, scenarios, etc.) ‘on the ground’, can result in adaptive problem-solving, potentially adding to and innovating people’s sustainable practice in an ever-improving way (Xiang, 2016). Furthermore, everyday environments are “shared plane[s] of existence” where social normativity is situated, and where normative change can correspondingly take seed and then become socially embedded (Whitehead, 2009, p.668), for example through role modelling (Steg & Vlek, 2009) and social support (Harré, 2011), creating further positive feedback loops.

A third form of sticky sustainability engagement is enhancing people’s sense of agency. A sense of agency to create change is one of the most well established psychological factors involved in motivating behavioural change (Ajzen, 1991; Bandura, 1977). Such agency can be reaffirmed by accompanying any information about desirable change with corresponding ‘prompts’ for what people can do next (Steg & Vlek, 2009). Thus, narratives of sustainability need to include not just things that people *want* to do in theory (to gain various benefits), but things that people *can* do in reality (Harré, 2011).

Mann and Smith (2011) propose motivational interviewing as one way to promote agentic selection of everyday changes towards sustainability that suit individuals’ unique contexts. Originally, motivational interviewing was a healthcare tool used in addiction recovery (Miller & Rollnick, 1992). Applied in collaborative and non-confrontational ways, the approach mirrors backcasting to degrees in that it aims to facilitate self-exploration of why change is sought or avoided; work through hesitations; envision and assess future scenarios; and pinpoint options for changing practice, resulting in self-constructed goals and plans and promoting self-motivated decision-making (Miller & Rollnick, 1992). Such self-generated ‘implementation intentions’ enhance stickiness of sustainable behaviour (Steg & Vlek, 2009).

Based on the collective expert insight generated through my interviews, I contend that such an approach has potential to encourage individuals, groups, and institutions to recover from metaphorical¹²⁴ ‘addictions’ to environmental domination, destruction, estrangement, despair, etc., and develop their own ‘recovery’ pathway towards improved sustainability. It could generate a significant diversity of visions for sustainability (across individuals and many mainstream fields) and an equally diverse range of practical starting points for change, empowering and engaging a fuller-spectrum of people as agents in the creation of sustainable futures (Neuvonen, et al., 2014).

124. Some unsustainable practices may constitute true addiction (i.e. compulsive, harmful thought or action; see Miller & Rollnick, 1992), but this is beyond the scope of my discussion.

Responding to this and uniting the above ingredients for sticky sustainability, I propose an inventory instrument that draws on ecological habitus (as an interdisciplinary theoretical framing tool that unites ideas from the interviews and the literature reviewed herein) to facilitate sustainability engagement in cities.

10.5 THEORY REVIEW

Analysing sustainability issues and envisioning how change in the present could aspirationally lead to a more sustainable future requires a theoretical heuristic capable of synthesising the interdisciplinary assemblage of ideas, practices, scales, and fields involved (Neuvonen, et al., 2014), as reviewed above. Bourdieu's 'habitus' (1972), a theory of practice, can inform such analysis, describing the practically-grounded, yet socio-historically contextualised ways that practice (including sustainable practice) evolves (Hargreaves, 2008). Moreover, the emerging offshoot of ecological habitus (Smith, 2001) has been developed especially for this purpose (e.g. Haluza-DeLay, 2008; Kasper, 2009a). See Chapter 2 for full reviews of both theories.

Three dimensions of Bourdieu's habitus and ecological habitus are especially relevant to my argument here. The first is the idea of habitus as individually durable, conservatively socially reproduced, and doxic (Bourdieu, 1998). The doxic, or 'normal ways' of being that individuals learn and embody when young are potentially stickier (more durable) than new, competing ideas, especially when confronted by unaccustomed social spheres or sources. Following this logic, the ecologically 'unsustainable habitus' that encompasses perpetual-growth, capitalism, materialism, globalisation, individuality, etc., is stickier in baby boomers (those born 1946-1964), for example, than contemporary innovations and shifts toward sustainability.

A second, closely related dimension of habitus is that individuals may routinely reproduce practices (including ecologically sound practices) without conscious recognition or critical reflexivity. For example, walking somewhere close-by instead of driving is an ecologically positive practice but may be undertaken primarily because it is convenient (e.g. precluding traffic and parking woes). Framing this positively, as a small 'sustainability triumph', could encourage individuals to walk more or to reflect more consciously upon the comparative ecological costs/benefits of walking/bicycling, private vehicle use, and public transport. Likewise, positively reinforcing the sustainable ecological contribution of individuals who use surplus hot water (e.g. water boiled initially for a hot beverage, then repurposed to fill a sink and wash dishes), is not only non-threatening to existing doxic dispositions and practices, but could stimulate reflection upon, and change to other domestic practices towards ecological sustainability.

A third dimension of habitus, which exemplifies the nuances of Bourdieu's theory, is that it is also generative, creative, and changeable, can be actively questioned, and potentially intentionally reformed (Reay, 2004; Sayer, 2005; Sweetman, 2003). Over time, people's social norms and structures; capital availabilities and desirability; practices; and dispositions are all seen to change. This happens at various paces. Consistent, gradual change that effectively fits within existing doxa is likely to become embodied as part of habitus without great disruption or cause for conscious reflection (e.g. trialling 'meat-free Mondays' rather than teetotal veganism). In contrast, intentional change (e.g. structured learning) necessitates a degree of conscious reflection. Although, once change is successfully embedded in everyday practice, this can also become embodied as routine and dispositional over time (e.g. enacting sustainability solutions such as composting at home after learning through a structured workshop). Sudden change, in contrast, has the potential to elicit a crisis of doxa and compel conscious reflexivity (i.e. awareness of things normally taken for granted; see Chapter 2). Resistance to rising fossil fuel prices is a topical example of this.

Nevertheless, conscious and critical reflexivity and intentional change to practice (or other dimensions of habitus) is increasingly common in today's world of pluralistic education, occupation, identity, politics, consumption, etc., with its rapidly developing technology, culture, science, etc. (Sayer, 2005; Sweetman, 2003). In terms of ecological sustainability, these factors together suggest that forthcoming generations, emerging into a world of ecological sustainability challenges, discourses, practices, and innovation may represent a generational shift towards sustainable ecological habitus, both as routine, everyday, subconscious dispositions and via periodic, critical reflexivity. However, such tenuous forecasts do not offer a solution. With ever increasing global resource use, such change in habitus is imperative and increasingly urgent.

It has been suggested that ecological habitus be developed as a conceptual tool for linking everyday practice to broader ecological issues (Gäbler, 2015; Kasper, 2009a; Poland, et al., 2011), and the theory has previously been applied to assess and describe the role of sustainable everyday practice within discrete, supportive, and small-scale social fields such as environmental social movement organisations (Carfagna, et al., 2014; Haluza-DeLay, 2006a, 2006b, 2008; Haluza-DeLay & Berezan, 2013) and educational settings (Karol & Gale, 2004). My approach here differs in that I examine and propose prospective ways to *create* change towards sustainable ecological habitus *outside* of existing sustainability fields as per my interventionist backcasting aim. This responds specifically to two challenges posed by ecological habitus scholars:

1. Gäbler's proposal that ecological habitus be used to generate and frame "narratives and ideas" (2015, p.84) that support practices of 'strong sustainability' (i.e. with concrete ecological benefits, unlike "greenwashing") that are more accessible than "critical leftist" (i.e. green niche) approaches (Gäbler, 2015, p.68). I apply ecological habitus to conceptually frame my narrative of an interventionist, interdisciplinary backcasting solution to everyday sustainable change in the city mainstream.

2. Kasper's (2009a) proposal that ecological habitus become a research tool for assessing and understanding all ecological habitus variants (sustainable or unsustainable). I develop on this idea (and Kasper's model¹²⁵ of ecological habitus dimensions) proposing a 'SEA inventory' as a way to assess practiced ecological habitus within the city mainstream¹²⁶, and facilitate self-determined development towards sustainable ecological habitus that is stickier for a greater variety of people.

10.6 DISCUSSION

In this discussion, I map out a potential pragmatic pathway for engaging a broader scope of mainstream city dwellers in sustainable practice. This synthesises the results of the interviews and interdisciplinary literature reviewed above and is presented through an optic of ecological habitus. I focus on changes to routine practice, but inevitably this involves the interconnected expansion of other components of ecological habitus (e.g. ecological capitals, reflexivities, social fields, etc.).

10.6.1 'Normal' habitus: the sustainability field vs. the city mainstream

Gäbler (2015) describes those already engaged in sustainability as a collective 'sustainability field', which has its own forms of socio-ecological distinction (e.g. ecological literacy and sustainable best practices). While sustainability is now a widely recognised concept, even in the mainstream, and the existing sustainability field is a source of inspiration and innovation, participation in sustainable practices remains relatively marginalised in favour of unsustainable norms, and needs to be bolstered. To this end, existing approaches can be limiting in three main ways.

Firstly, existing sustainability approaches and the specific fields they occupy are often perceived as different from people's 'normal' or mainstream practices and fields (which are less sustainable by definition). People often have particularly "powerful convictions" about what is 'normal' and socially acceptable, so sustainable practices that fall outside of this can be rejected (e.g. reduced showering to save water and electricity may be regarded as contrary to norms of personal health; Southerton, et al., 2004, p.14). This can be a response to some top-down approaches. For instance, if structuring of capitals for sustainability (e.g. government spending on conservation) appears unrelated or disadvantageous to people's accustomed practices and fields it may be opposed (Blake, 1999; Fischer, 2001; Gäbler, 2015). Similarly, green niches differ from the mainstream, with different forms of social distinction (e.g. green politics; Antonio & Brulle, 2011), different reflexivities, and different practice norms (e.g. ethical veganism), which can be perceived as

125. See Figure 8, p.127.

126. Which is unsustainable overall based on cities' per capita ecological footprints.

exclusive (Nagel, 2005). This can place sustainability engagement outside the ‘realm of possibility’ for mainstreamers and the ‘rules’ of their accustomed ecological habitus.

Secondly, negative messages, including from existing sustainability fields, can compound this distancing, provoking negative emotions around sustainability (e.g. fear, grief, guilt) that people typically want to avoid (Harré, 2011). Similarly, regressive presentations of what a sustainable future might look like (or feel like) may be rejected if perceived to involve losses to people’s senses of distinction or progress in the pursuit of other capitals (e.g. material, social, technological), or if they might disturb people’s practice routines (e.g. in terms of routine diet, transportation options, finance etc.). They may also present or provoke critical ecological reflexivity, resulting in uncomfortable or confronting breaks in *illusio* and recognition of the shortcomings of the unsustainable status quo (Allen, et al., 2017).

Finally, mainstream individuals may also lack, or perceive they lack, the functional capitals (social, economic, cultural, and symbolic) necessary to participate in sustainability. The perceived or actual separation of the mainstream from the sustainability field may also limit people’s sense of agency in sustainability transitions. Perceiving themselves outside of the field may reinforce notions that participating is beyond their capabilities.

10.6.2 Starting smaller to change what is ‘normal’: SEAs for mainstream fields

I contend that ‘normal’ everyday life in the mainstream of city people could be an important place to begin generating routine sustainability practice towards more widespread social change (Brand & Wissen, 2012; Whitehead, 2009). Everyday life offers a forum for introducing sustainable alternatives in relatively palatable ways that can nevertheless incrementally disrupt the doxic reproduction of unsustainable ecological habitus in Western cities. Simultaneously, such changes would reveal commonalities between mainstream and sustainability fields, and begin to dissolve the normative barriers to participation that mainstreamers may perceive, allowing for evermore broad-spectrum sustainability participation.

I propose this could begin within a practical SEAs inventory that takes place within people’s everyday social fields and existing capital capacities (e.g. Hargreaves, 2008); emphasises personalisation by being tailored to the needs, values, and limitations of individuals (Steg & Vlek, 2009); and promotes positivity, as a constructive, empowering, and socially supported process (Harré, 2011). This corresponds with ecological habitus theory, where the actions one is most positively disposed toward align with one’s habitus, social contexts and personal dispositions (Haluza-DeLay, 2006b), and offers three ‘sticky’ ways to improve sustainability engagement.

The inventory would ideally take the form of a participatory, workshop-like scenario, where people could firstly identify their existing sustainable practices and then brainstorm ideas, research sustainable alternatives, create inspiring visions for change, learn from and share ideas with one another and/or with workshop facilitators, and experiment with everyday sustainable practices. The goal would be for people to emerge with a better appreciation of their existing contribution to sustainability, and a personalised, practical set of new SEAs they felt positive about, were invested in, and were self-motivated to enact as part of constructive change towards more sustainable ecological habitus.

Examples of mainstream fields that could adopt the SEA inventory could include workplaces; gyms or sports clubs; church congregations or other religious groups; street, craft, or vegetable markets; cooperatives or businesses; individual households; or music, cultural, or sporting clubs/groups. Fields with children among them (e.g. classrooms, schools, or other educational forums, or parenting groups, etc.) offer a particularly potent opportunity for creating life-long sustainable ecological habitus (Louv, 2005; Pyle, 2008; Thomashow, 1996). The inventory could be tailored to individuals' activities within specific fields (e.g. how employees transport to workplaces) or could encompass the field as a whole (e.g. a waste/energy inventory of a workplace; Hargreaves, 2008).

a) **What constitutes a SEA?**

Ideally 'small' ecological actions would be immediately actionable (e.g. today, tomorrow, or this week) within people's everyday environments (e.g. homes, workplaces, or recreational spaces), and require little supplementary infrastructure, knowledge or skill (e.g. see Table 11, column 3, below). Such ease would likely increase initial (and ideally permanent) change in practice (Steg & Vlek, 2009). SEAs enable people to begin from where they are already situated, rather than necessitating a given threshold of existing practice or attempting radical change. SEAs that provided immediate benefits (e.g. cost savings) or generated positive affective feedback (e.g. social or sensory) would also leverage people's innate biopsychosocial disposition towards positive emotions, socially rewarding experiences (Harré, 2011), and acquisition of new capitals (Bourdieu, 1979), thereby increasing their stickiness and people's openness to change (Harré, 2011). Furthermore, SEAs could also include 'circuit breakers' that increase the stickiness of other SEAs. For example, simply setting a timer near the shower could enable easy self-monitoring and reduction of shower duration, saving valuable resources.

To constitute small 'ecological' actions, SEAs would necessarily contribute to 'strong sustainability' (i.e. concrete, net positive effects on natural capital), either by enriching natural capital directly (e.g. by composting or planting trees) or by reducing waste outputs (e.g. purchasing fewer consumables, reducing packaging waste and transport emissions). Many actions would have multiple ecological co-benefits. For example, a simple SEA such as shortening shower time, compounded across many

city dwellers, could reduce fresh water extraction, preserving water quantity and quality within reservoir and catchment areas (e.g. potentially increasing biodiversity), as well as saving energy used to heat/pump water, and reducing the need for pollution mitigation (i.e. wastewater processing).

Table 11: Small ecological actions (SEA) inventory exemplar.

1. Dimensions of ecological habitus adapted from Kasper (2009a)	2. Examples of pre-existing SEAs	3. Examples of new SEAs that could be added	4. Examples of individual benefits from additional SEAs
Food	Occasional meat and/or dairy free meals.	Add a meat and/or dairy free meal per day/week.	Health, novelty, ethics, lower cost.
Water	Shower instead of bath.	Shorten showers.	Save time and money (e.g. cost of hot water).
Waste	Eating leftover food.	Compost vegetable scraps/peels, etc.	Gain free compost, cheap/convenient waste disposal.
Energy	Occasional walking, cycling, or public transport use.	Routinely walk, bicycle, or take public transportation to work, school, or activities.	Healthy, relaxing, and cheaper. Potentially safer and more social.
Finance	Purchase 'environmentally friendly' products (e.g. laundry soap).	Seek second hand over new (e.g. purchase furniture and homeware from charity shops) and upcycle.	Better quality, lower cost, more unique, supports charity.
Nature in everyday life	Incidental encounters with birds in parks or gardens.	Plant vegetables or flowers to encourage insects, birds, etc., into garden.	Mental/physical health benefits, aesthetic pleasure for self and others.
Ecological capital in everyday life (e.g. awareness, skills, social involvement)	Incidental encounters with ecological/sustainability promotions.	Engage with ecologically - orientated books, movies, webpages, talks/presentations, groups, friends, campaigns, or movements.	Entertainment, knowledge, sense of community, influence on top-down decisions.

Any SEA could (by definition) be framed in terms of these ecological impacts, but one way to make SEAs more sticky would be framing them positively in terms of individual benefits (Eckstein & Throgmorton, 2003; Harré, 2011; Levin, et al., 1998; Meadows, et al., 2004). For example, shorter showers might save on water heating costs and time. Thus, rather than targeting

an ‘end state’ that might seem unattainable, unrealistic, or disempowering, the goal of SEAs would be to create directional change through an assemblage of pragmatic and available approaches that shift individuals incrementally along a more ecologically sustainable trajectory (Lorenzen, 2012).

b) Beginning where you are: recognition and celebration of existing SEAs

The first step in the SEA inventory process that I propose would therefore be collaborative mapping of people’s existing, everyday ecological habitus, including specific values, existing practices, reasons for wanting to change (or resisting change), capabilities, barriers to action etc., in the same way as motivational interviewing (Miller & Rollnick, 1992). The focus would be on recognising and celebrating various SEAs that individuals already practice (Table 11, column 2). This would highlight the existing dimensions of their sustainable ecological habitus and correspondingly their legitimate place (however small) within the existent ‘sustainability field’. Identifying such common ground has the potential to bridge some of the political or other polarities perceived to occur between dedicated agents of sustainability and mainstream city dwellers. Recognising, celebrating, and positively reinforcing existing behaviours (and avoiding being overly-comparative, cautionary, or disparaging) can be an effective way to motivate sustainable practice and cement people’s identification with a sustainable-self (Harré, 2011).

The SEA inventory could begin with the full spectrum of ecological habitus dimensions (derived from Kasper, 2009a) shown in Table 11 (column 1), or could involve various configurations and combinations of these dimensions, for example:

- A systematic assessment of all dimensions, one-by-one, over time (e.g. during regular meet-ups, or across a series of workshops);
- Initial focus on one area of personalised interest (e.g. animal welfare; Clayton, et al., 2009), a practical need (e.g. everyday cost-savings), or a latent potentiality within a field (e.g. assessing and mitigating against inefficiencies, such as food waste in domestic settings that could instead be composted); or
- Focus on themes that traverse dimensions. For example, food related SEAs might appeal to people’s interests in health, body image, food cultures, or social distinction (e.g. wine), while also traversing dimensions of ecological habitus including water and energy (in production, processing, presentation, and transport), food waste (including packaging), the costs of food consumption, the effects on natural capital (e.g. palm oil production or industrial agriculture), and links to ecological capital (e.g. vegetable gardening skills/knowledge).

c) Incremental growth of sustainable ecological habitus: experimenting with new SEAs

Having established a baseline, and familiarised participants with the SEAs they already practice, the next steps would be for participants to self-identify personalised and practical new SEAs (e.g. Table 11, column 3) and to experimentally adopt these (ideally in collaborative contexts and with assistance from initiators as explained below). Such SEAs could be selected because they are exciting, novel, and/or beneficial additions or enhancements to a person's existing practice, or chosen to enhance existing SEAs, thereby introducing change while effectively maintaining (albeit incrementally shifting) doxa and enabling routinisation of practice with relative ease. This would provide individuals with a sticky series of 'first steps', empowering them as agents of sustainability, and circumventing potential perceptions of dictatorial, overwhelming, or 'out of touch' prescriptions for change.

This would focus initially on demonstrating the value of SEAs to people's existing dispositional interests (e.g. those with emotive, capital, or moral benefit; Table 11, column 4), which can be compelling motivators of change to practice and habitus as a whole (Sayer, 2005). Some of these, such as being healthy, spending time with family, and seeking to secure a promising future for one's children, are almost universal. Others could be tailored to the specific needs or limitations of the field (e.g. financial benefits). Positive framing and alignment of SEAs within field-specific habitus could also counter perceived negative 'sacrifices' that may be associated with becoming more sustainable (Hall, 2013). Additionally, because practicing SEAs would result in greater ecological sustainability at the collective biospheric level (i.e. net gain in natural capital), this could also be highlighted, to reinforce SEAs with an additional layer of moral positivity.

Thus, new SEAs would ideally be presented in ways that resonate with individuals in particular fields, building on the baseline of information already established. Within each field, individuals might already participate in similar SEAs and be interested in adopting new SEAs as a group, or different people might have different starting points, each requiring a tailored set of new SEAs. Individuals could thus learn from and aspire to the different examples that others in the group already practice, in addition to discovering or inventing new SEAs (with prompts from an initiator as explained below).

Table 11 and/or other existing inventories (e.g. ecological footprint calculators; see GFN, 2016) could be used or adapted for this purpose. Again, this would ideally take a positive tone, focusing on achievement rather than deficiencies and creating a non-judgemental, perceivably safe space where people could reveal what SEAs they undertake, build their enthusiasm for SEAs (and ideally for ecological sustainability as a whole), and also benefit from peer-support. Ideally, participants would become increasingly competent at identifying existing and potential SEAs for themselves.

The shared social experience of the inventory, recognising existing SEAs, and practicing newly embraced SEAs within accustomed fields would also offer a degree of social support that makes sustainability stickier (Clayton, et al., 2017; Haluza-DeLay, 2008). Moreover, the knowledge and skills that people could gain by undertaking the inventory alongside their peers (and initiators) could empower them with additional capitals (especially cultural and social) and new ideas for practical action. It would also ideally be a ‘soft’ way to enhance everyday conscious/critical reflexivity with regards to their ecologically salient practices, although a focus on comparison would ideally be avoided to retain the constructive and positive tone (Harré, 2011).

d) **SEAs Initiators**

One way to introduce SEA inventories would be through an informed initiator who would ideally be a valued and influential individual within the particular field. Gladwell (2000) describes three types of people who are significant to spreading ideas through society, ‘mavens’ (in this context, sustainability experts or people with established ecological reflexivity), connectors (who bring people together), and salesmen (people who communicate ideas in sticky ways). A person with all of these capacities, or a combination of people who had these capacities between them, would be ideal initiators of SEAs.

The initiator’s main role would be facilitating individuals’ recognition of their existing SEAs, facilitating identification of new SEAs that could practically be introduced, and highlighting/communicating their individual benefits. This personalised, practical, and positive focus differs from existing approaches in the sustainability field that generally have their own specific (and legitimate) agendas (e.g. focusing on timely, critical, or marginalised issues). The initiator would ideally be able to provide diverse examples of different types of SEAs; to share knowledge about the socio-ecological issues at stake, how to respond appropriately, and what the ecological benefits of change could be; to foster positivity, creativity, collaboration etc., within the inventory experience; and to support the ongoing practice and growth of SEAs within the field. Providing prompts about how change might begin is especially important to creating enduring change in behaviour (Steg & Vlek, 2009).

The initiator could be a proponent from inside or outside of a field. Examples of outsiders might include community-based activists, government sponsored specialists, amateur-enthusiasts, educators, and cultural or spiritual leaders. Being an initiator could offer people who are involved in top-down and green-niche approaches a potential way to branch out and engage with more mainstream fields. However, such an outsider would need facilitation, education, ethnographic or other competencies and priming in positive prompting of practical and personalised practices to enable successful habitus-specific engagement. An outsider would also need to be able to build

rapport and open communication, and be able to convey ideas in positive, practical, personalised and otherwise sticky ways.

Another option for outside initiators could be to work alongside a community personality or other socially-esteemed individual (Harré, 2011) with field compatible habitus, whose distinction (e.g. symbolic, social, or cultural) gave them influence. An example of this that I came across during the course of my fieldwork was the football matches held at Ohio Stadium. There, the symbolic capital of the state's idolised football stars, the Buckeyes, is leveraged to encourage the 100,000 odd spectators who comprise the ephemeral field of football events to be 'true Buckeye fans' and minimise waste to landfill by recycling during each event. As a result, organisers have largely succeeded with their zero waste goal, claiming that less than 5% of waste from the matches now goes to landfill (OSU, 2017).

In contrast, an insider initiator would require awareness and understanding of ecological issues and sustainable practices, and priming (or collaboration) to incorporate these effectively. However, their personal attunement to existing habitus in the field (including social dynamics, routine practices, individual and collective dispositions, etc.) would benefit the stickiness of their communication in this role. Examples might include a friend, team member, colleague, family member, or any person seen as 'one of us' within a given social field. Such insiders would also hold a degree of social/symbolic capital (i.e. standing and trust), which could help them to encourage participation among their peers. Ideally, by participating in the SEAs inventory process and practicing new varieties of SEAs, people within mainstream fields would develop ecological capitals (e.g. knowledge and skills) over time, enabling some of them to become initiators and role models in turn, and encouraging progressively more SEAs to be adopted in ever-evolving, self-reinforcing, and trans-field sustainable ecological practices.

Many SEAs are compatible or even symbiotically interlinked, so that adding novel SEAs can become easier and more advantageous over time. Growing produce in a garden at home, for example, would save on packaging, transportation, etc., would generate new seeds that could be saved for growing the next season's crop (free of cost) or sharing, and food scraps might be composted to fertilise the garden afresh, thus recycling resources (also free). The major strength of SEAs is that there are an infinite number of possibilities, which is recognised elsewhere as important for uptake of new behaviours (e.g. Hawken & Steyer, 2017). The aim of the inventory process would be to provide people with an arsenal of these potential 'first steps', empowering them to engage in creating sustainable ecological change from where they are and in ways that are immediately tangible and resonate with them.

e) **SEAs upon SEAs: routinising SEAs and incrementally up-scaling**

As Gladwell asserts, “creating one contagious movement” first requires “many small movements” (Gladwell, 2000, p.192). The aspiration, of course, would be that SEAs could eventually be scaled up (e.g. from one day per week without driving a personal vehicle, to two days or more), act as building blocks upon which additional SEAs might be stacked (e.g. savings from vehicle free days could be put towards buying a bicycle), and spread from individuals, to fields, and ultimately into trans-field change.

A person’s repertoire of sustainable ecological dispositions, practice and ecological habitus overall could thus continue to be expanded in a variety of ways. Individual’s practiced experimentation with SEAs could also enhance critical ecological reflexivity and inspire identification of further (or improved) sustainability practices (Xiang, 2016), and other ecological capitals could also grow (e.g. skills grown through practice or via role modelling, and knowledge shared between participants and initiators). Additionally, while novel SEAs would be practiced intentionally at first, if routinised, they would eventually become embodied into people’s dispositions (Figure 17), fortifying their sustainable ecological habitus in enduringly-sticky ways (Bourdieu, 1972). Even psychological dispositions could be incrementally adapted. For example, positive, empowering narratives of everyday practices could diversify or change what is perceived to be ‘normal’ practice within the field, and what is possible for the individual (Eckstein & Throgmorton, 2003).

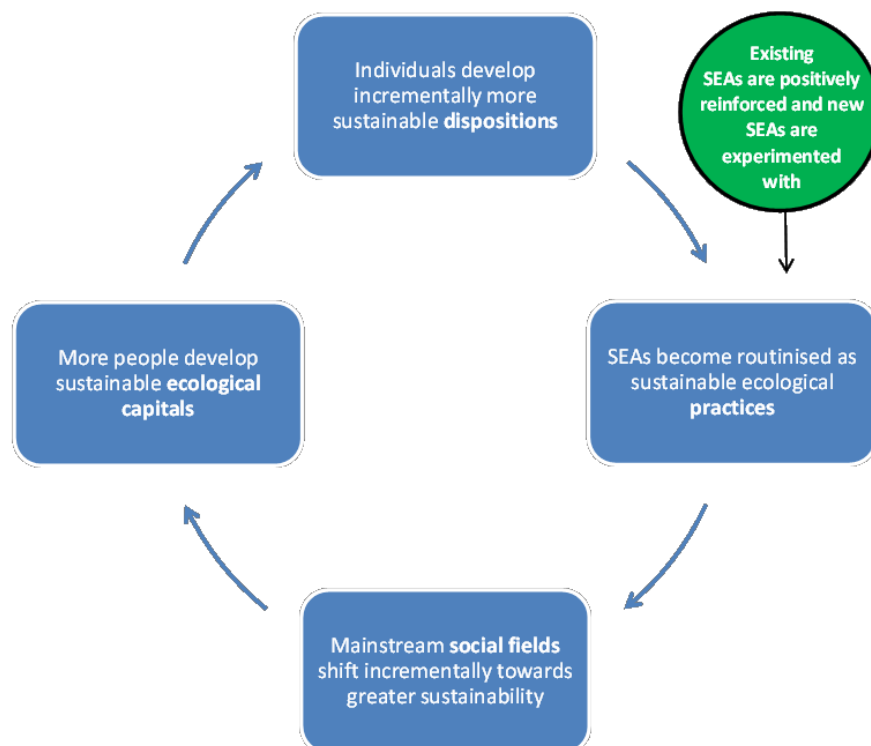


Figure 17: Model showing how SEAs could become incorporated into ecological habitus over time. Arrows show how each factor cyclically produces and reproduces the next.

Practiced SEA change by individuals could collectively and incrementally shift practice in the mainstream over time, and the addition of collective ecological capitals could also potentially change structures of distinction or other social metrics, improving social support for ongoing SEA change (bottom of Figure 17). Because individuals practice their ecological habitus within the different fields they inhabit, their practices would permeate additional fields, potentially affecting the same changes. The capitals gained through ongoing SEA practice could also increase ecological democracy (including understanding of and affinity with existing sustainability fields), potentially empowering mainstreamers to engage with compatible top-down initiatives or green niches. Potentially, participants may even establish their own niche sustainability social fields, in the same way as Louv's family clubs have done, providing a further forum for the socialised development of sustainable ecological habitus in a greater diversity of city dwellers.

Furthermore, existing infrastructures that support sustainability in cities (and beyond) could also support growth in SEAs, enhancing city dwellers' abilities to practice SEAs and potentially fostering engagement with the existing sustainability field. This could include:

- Place-based education (Thomashow, 1996), collaborative projects and programs (Cortese, 2003), and practical skills workshops (Haluza-DeLay & Berezan, 2013) to build people's ecologically salient capitals including knowledge, skills, reflexivity, and social support (Haluza-DeLay, 2006b; Karol & Gale, 2004);
- Embodied experience in nearby-nature (Pyle, 2003) to foster ecological affinity (Kellert & Wilson, 1993), a sense of connectedness (Mayer & Frantz, 2004), empathy (Schultz, 2000), identity (Clayton & Opatow, 2003), reflection (Čapek, 2010), and ethics of sustainable ecological habitus (Smith, 2001);
- Green infrastructures (e.g. municipal composting) to enable easy routinisation (Horton, 2006) of sustainable ecological habitus;
- Recreational opportunities such as films or games (Costanza, et al., 2014), zoos (Clayton, et al., 2009), social media (Clayton, et al., 2017), and events (Horton, 2006) to inform and normalise sustainable ecological habitus in everyday life;
- Symbolic recognition within the sustainability field (Gäbler, 2015), such as environmental performance or carbon ratings, to leverage people's desire for ecological distinction (Bourdieu, 1979);
- Time banks for sharing/exchanging time and skills (Schor, 2010); distributed networks to enable idea sharing, social networking, and organisation of informal group activities through digital technology (Haluza-DeLay & Berezan, 2013; Louv, 2011); or multi-directional (up, down and sideways) idea-sharing networks (formal and/or informal) (Perlman & Hopkins, 1998);
- Libraries or cooperatives for sharing tools, vehicles, produce, etc., to reduce consumerism and ecological footprints (Hopkins, 2008); and
- Informal collaboration in the work-place to facilitate sharing of ideas and resources and novel idea creation (Kreiner & Schultz, 1993).

Successful implementation of the SEA inventory approach within individual social fields would increase the proportion of mainstream city dwellers who actively practice SEAs, increasingly normalising these across various social fields, and enhancing the likelihood that others would replicate them (Harré, 2011). This could make sustainable ecological habitus stickier and stickier, and ideally, ‘green’ the routine of the city mainstream. Moreover, this inventory approach is flexible, transposable, and not limited to the mainstream fields exemplified above. It could, for example be applied in city leadership fields (institutional, cultural, etc.), contributing to their individual sustainability practice and potentially prompting critical ecological reflexivity in their leadership practices; people within existing green niche groups, as a means of sharing ideas and boosting net ecological gains; or as an educational tool, to promote and exemplify ecological practice in upcoming generations.

As historical revolutions (e.g. civil rights) demonstrate, and theories of revolution describe (e.g. Kuhn, 1970), ideas that are marginalised to begin with can, under the right conditions, rapidly permeate the populace to become accepted parts of mainstream habitus. Creating sustainable ecological habitus in the city mainstream is one such revolution that the 21st century demands, and I suggest that the SEA inventory adds one more starting point where a constructive response to this challenge can begin.

10.7 CONCLUSIONS AND RECOMMENDATIONS

I propose that SEAs offer a potentially sticky way to engage people from mainstream city fields with sustainable ecological change. Focusing positively at first on what people already do on an everyday basis, within their existing individual habitus (i.e. dispositions, capitals, reflexivities, and practices), and their ordinary social fields, and focusing in a personalised way on practical things they could incrementally improve upon without (or before) moving on to larger or more aspirational pursuits, could make SEAs sticky in ways that complement existing top-down or more radical green niche approaches. The infinitum of possible SEAs means that any individual who participated in the inventory process could identify a set of first steps that resonated with their dispositions, values, and practice capabilities and might be segued easily into their existing habitus. Intentionally practicing, and ideally routinising, expanding, and adding to their SEAs with the support of their social networks and relevant initiators could support mainstreamers’ understandings and reflexivities of ecological sustainability issues; how these relate to and benefit their established ecological habitus (e.g. deeply held values, capital benefits, and practical limits); and the ways that SEAs can contribute to creating broader-scale change.

Introducing the SEA inventory into mainstream city fields has the potential to generate routinized and subconsciously embodied ecological capitals, practice, and habitus in a diversity of city

dwellers, and offers interesting scope for applied research. Ideally, SEAs would reduce the ecological impact of these profuse fields, while helping to incorporate disengaged mainstreamers as participants in sustainable practice, and ultimately normalising sustainability for the future of Western cities.

The SEA framework presented here represents only a germ of an idea. Testing and refining the concept through practice within different social fields, through case studies, (auto)ethnographic, action-research or other applied approaches offers potential for refining the model, identifying additional pathways for SEA change in mainstream society, and reducing cities' collective ecological footprints. The framework could be developed further with reference to extant interventional methodologies such as strategic sustainability, social ontology, collaborative design, addiction recovery, or transtheoretical behaviour change (Mann & Smith, 2011). These are interesting avenues for potential future research.

Furthermore, this framework develops on the epistemological and praxis potentialities for the developing field of ecological habitus by responding to Kasper's (2009a) suggestion that it be developed as a tool for assessing habitus of unsustainability as well as sustainable variants, and Gäbler's (2015) suggestion that it be applied to frame practical sustainable-change narratives. Additionally, research to describe and change less-sustainable ecological habitus (e.g. found in intensive agriculture, oil, coal or other mining industries, manufacturing, wildlife poaching, single occupancy vehicle commuters, etc.) or mixed ecological habitus (e.g. in classrooms or randomised samples) would be more challenging than describing existing sustainable fields and presents another new and interesting forum that the SEAs inventory could be applied to.

You can't go back and make a new start,
but you can start right now and make a brand new ending.

—James R. Sherman, *Rejection*

Chapter 11

CONCLUSIONS AND RECOMMENDATIONS

11.1 INTRODUCTION

The pursuit of ecological sustainability is critical to achieving economic, social, and cultural sustainabilities, and therefore to the collective global future. For the majority of the world's population, especially in Western countries, cities are the context within which this struggle plays out day-to-day. This thesis responds to the challenge faced by contemporary environmental management researchers, to link the large-scale, interdisciplinary, and complex socio-ecological crises that humanity is currently facing, with what people do in their day-to-day lives, and importantly, what they could do differently to strategically and pragmatically respond to these crises, answering the question: How then *could* we live?

Responding to this overarching research question, the aim of this thesis was to identify pragmatic pathways towards ecological sustainability, through strategic change in people's everyday lives within Western cities. This was achieved by addressing the four objectives stated at the beginning of the thesis. In this chapter, I provide a succinct description of how each objective was fulfilled, including brief summaries of key ideas and descriptions of my contribution to existing literature. At the end of the chapter, recommendations for prospective future research are given, before the chapter's conclusion.

11.2 UNITING LITERATURE FROM DIVERSE DISCIPLINES

Objective 1 of this research was to review literature from across disciplines related to socio-ecological problems and solutions in contemporary Western cities, in order to identify leading experts to be interviewed. Accordingly, my initial literature review was a scoping exercise, engaging many substantive fields of literature as is standard in exploratory, grounded, and inductive research. This provided the broad information base needed to formulate subsequent stages of my research, particularly the selection of experts. There was no existing synthesis of literatures or framework that clearly defined topics or disciplines to include in such research. Thus, selection was primarily based on my own understandings as informed (and limited) by my academic background, but also developed iteratively through my readings. This began with database searches for relevant material, and a secondary selection of material gleaned from these

initial sources. Over 150 articles (from 70+ different journals), and more than 60 books were reviewed during this first review alone. These encompassed a spectrum of relevant disciplines including environmental management, anthropology, education, environmental engineering, landscape architecture, philosophy, planning, policy, psychology, sociology, and city design.

A conceptual map was generated to organise this literature. This denoted four broad analytical ‘domains of knowledge’. These were ‘society’ (social aspects of city life); ‘habitat’ (biophysical aspects); ‘stewardship’ (socio-ecological interactions); and ‘future’ (forecast-orientated literature). This overview enabled me to orientate my research within the topical literature landscape, and select a variety of relevant experts. I selected the experts from across the four domains, based on an assessment of their relative positions on my ‘map’ and the possession of other attributes (i.e. collaborative; interdisciplinary; solution-orientated, and future-thinking approaches). This provided a diverse group of experts, and the interviews generated an equivalently broad dataset. Correspondingly, this thesis unites a broad scope of literatures, which ultimately included some material from the initial review; ideas raised within interviews and recommended by the experts; and topical material of relevance to the resulting backcasted pathways.

This approach brought together many complementary ideas from different disciplines. For example, ‘natural capital’ from ecological economics is used to critically discuss the lack of such a concept within Bourdieuan habitus theory. The thesis also unites parallel ideas that until now appear to have evolved in mutual exclusion. For example, ‘ecological habitus’ and ‘habitus of sustainability’ describe the same phenomenon, in different ways, but these ideas are not discussed together elsewhere and discussions of each do not refer to the other. In this thesis I engage both and construct a more holistic portrait of ecological habitus as a value-neutral way to assess natural and ecological capitals and ecologically salient dimensions of habitus (dispositions, practices, reflexivities, fields) within individuals, groups, institutions, and even whole societies. Ecological habitus is also presented as an aspirational way to frame backcasted ideals for sustainable ecological habitus variants. Finally, this thesis unites existing ideas to bridge gaps between scholarly silos. For example, ‘ecological reflexivity’ has until now been used casually across many disciplines without an established theoretical platform. Here I engage Bourdieu’s well-developed concept of ‘reflexivity’ to present preliminary theoretical development of ecological reflexivity.

The diversity of topical literature discussed in this thesis was necessarily synthesised to inform my theoretical development of the ecological habitus framework, which was devised for conceptualising and assessing socio-ecological change, and framing prospective interdisciplinary pathways to sustainability in future cities. Meanwhile, a variety of methodological literatures were synthesised to inform my research process. Each of these syntheses is covered below.

11.3 GENERATING EXPERT INSIGHT AND FORESIGHT THROUGH QUALITATIVE INTERVIEWS

Objective 2 was to design a qualitative expert interview instrument and apply this to generate expert interdisciplinary insight and foresight that responds to the research aim. Accordingly, the thesis includes a detailed, transparent, and reflexive description of the process that I undertook to design, conduct, and analyse the expert interviews, and the methodology that underpinned this process. Qualitative interviews in general are an established method in social sciences and are increasingly common in environmental management research. They provide for generative and exploratory research such as mine by using open-ended interview questions to prompt in-depth responses that address the research aim. Expert interviews are an effective means of generating well-informed, concentrated, relevant, and up-to-date insight and foresight. This is a value that is recognised particularly in sustainable-futures research, where Delphi approaches (which are generally quantitative) engage experts to inform scenario-building and backcasting.

There is, however, a distinct paucity of research detailing qualitative and expert-focused interview methodologies, such as the dissensus Delphi that I used. Furthermore, in the literature that does discuss this, interviews that invite both professional insight (i.e. technical knowledge from an ‘expert as interviewee’) and practical insight (i.e. experienced understanding from the ‘person behind the role’) are recognised as an under-explored ‘grey area’. Consequently, the variety of methodological literatures that I synthesise is unusual, but necessary for this research, and has potential for future developments and applications. Engaging these literatures to inform my own approach, and providing a detailed account of this (including my interview design, execution, adaptation, and experiential reflections), contributes a substantial and detailed case study of this mixed-methods approach.

Developing the method itself began with the literature review and conceptual mapping discussed above, resulting in selection of 32 North American experts (from a global list of 106) to interview. Selecting North American experts enabled me to incorporate a breadth of different expertise within the interviews while meeting temporal and financial constraints. The experts included psychologists, designers, philosophers, educators, sociologists, planners, economists, landscape architects, activists, and artists amongst others. This sample provided for a diversity of practice-informed and specialised insights as well as different disciplinary terminologies, local and international issues, approaches to problem-solving, etc. Such breadth of insight is another of the defining benefits of my approach.

Subsequent steps of the method highlighted some limitations. Gaining access for expert interviews poses recognised challenges including prospective participants’ busy schedules, and whether they consider the research interesting or ambitious enough to be worthy of their time. I employed a

number of strategies to work around this including appealing to the experts' curiosity of the topic by providing information, highlighting their place alongside other renowned experts, and demonstrating my dedication by meeting them in their own spaces at times that suited them.

I conducted 25 expert interviews in total. Of the 32 invited experts, 20 were able to be interviewed, 18 face-to-face, one by telephone, and one by email. The interview process began with providing information about my research to the experts before the interviews. Each interview lasted one hour on average, was recorded (with permission), and included final discussion of potential resources to review or additional experts to meet with. Five additional experts were interviewed as a result of these 'snowball' referrals - a recognised way to gain privileged access to experts for interviews.

Within the interviews, my positionality as a young foreign female researcher interviewing mid-to-late career experts may have increased the candour of expert response (e.g. providing a non-threatening yet informed, interested, and dedicated audience with whom to discuss their perspectives). I was also challenged by critical responses to interview questions and wording. The reflexivity that this required of me as a researcher was unexpected (and uncomfortable) with reference to my previous experiences with 'the scientific method' (i.e. 'objective' hypothesis testing), but this was nevertheless valuable to my evolving understanding of the issues that my research and method sought to explore, including the different disciplinary terminologies, concepts, practices, etc., involved, and the difficulties of interdisciplinary research itself. The email and telephone interviews were less fruitful than the face-to-face interviews, which may have been a consequence of the comparative inability to build rapport with these experts. Unfortunately, with only one telephone and email interview respectively, there was no option for revising and refining my approach to these.

Despite (and sometimes because of) these challenges, qualitative expert interviews as a data generation instrument enabled me to gather targeted, judicious, yet complex, nuanced, and diverse insight (and foresight) from the front lines of expert thought and practice in city sustainability. My reviews of the literature demonstrated to me that significant elements of this insight were unavailable in published accounts. Moreover, a major benefit of expert interviews was their capacity to provide distilled information from a lifetime of specialised learning and experience, highlighting key themes and future trajectories for sustainable cities from multiple disciplines. Invitation, in the interview, for the 'person behind the role' to present their perspective (specialised and experience-informed nonetheless), provided opportunity for expression of insight that was nascent, informal, marginal, or otherwise not a professional focus of the expert. This elaborated upon recorded knowledge and spanned knowledge silos that exist, for example, because of structured constraints to publication (occupational, intellectual, social, financial, etc.). Finally, the spontaneous introduction of relevant material that was possible through qualitative

interviewing (particularly face-to-face) proved another benefit of this approach that is largely unparalleled through quantitative alternatives (e.g. surveys). The sheer quantity of data that was generated through the interviews (more than 160,000 words when transcribed) represented success in terms of elicitation. Analysis showed that the quality and diversity of response was equally as rich and informative to the research aim.

Thus, in response to Objective 2, this thesis provides a detailed, transparent, and reflexive method and methodology of the design and execution of qualitative expert interviews to generate interdisciplinary expert insight and foresight in response to the research aim, including the benefits of the approach, the difficulties involved, and the ways that these were responded to.

11.4 DEVELOPING ECOLOGICAL HABITUS AS A FRAMEWORK FOR ANALYSIS AND PRAGMATIC CHANGE

The next phase was data analysis. Objective 3 was to develop a methodological and theoretical framework for analysing the interdisciplinary expert interview data and using this to frame pragmatic pathways towards future sustainability. Ecological habitus was thus developed within this research as a comprehensive framework to conceptualise socio-ecological change, to analyse the interviews, and to frame the research results.

Ecological habitus was selected in a relatively grounded way during the analysis process. Initially, the analysis took an inductive, constructive, grounded theory approach to identify emergent topics from the data that were relevant to the research aim. This was enhanced by the immersive transcription and coding phases, which were conducted independently (i.e. without an assistant transcriber or coder) and manually (i.e. without coding or analytical software). Although such immersion was beneficial to the analysis (e.g. heightening my critical reflexivity and familiarity with the data), it was time consuming and labour intensive due to the large scope of the research question, richness and diversity of the interviews, and correspondingly large volumes of raw data. Teams of researchers are engaged in most research of this nature, as reported in the literature, and a collaborative approach would have expedited this process. Similarly, engagement of a familiar theoretical framework, as is the choice in most ‘grounded’ research would have eased the intellectual challenge of the data analysis. A visual map was constructed using sticky notes to depict a ‘bigger picture’ of the most relevant data, and key topics were identified from this, before the thematising part of the analysis began.

Depiction of the analysis process is another part of the transparent method and methodology that I provide herein, which detail the iterative, often convoluted, and creative approaches that can be involved in such analysis. Examples of such processes are often sanitised and simplified in

published literature and theses alike (based on my reviews to date), but true-to-form depictions are necessary for self-reflexive and peer-appraisal of technique, and to inform and exemplify research processes for other novices or reflexive practitioners. Reporting on this methodology was correspondingly part of my own reflexive analysis process, and offered me insight that has transformed my research outlook from the perspective of an ‘objective’, quantitative ecology-major starting out, to a developing reflexive, qualitative socio-ecological researcher. While expecting to learn ‘knowledge and facts’ that arose from the specialised realms of the experts, I was less prepared for the reflexive capacities that their diverse perspectives would lead me to develop. This was a significant outcome of the research in terms of my professional and intellectual development.

The latter part of the analysis was ‘thematising’, where key topics from the data were constructed into ‘backcasted’ pathways for sustainability in future cities. Ecological habitus was adopted as a theoretical framework during this phase. Derived from Bourdieu’s ‘habitus’, ecological habitus describes the dynamics of socio-ecological relationships, encompassing individual (e.g. psychological, cognitive, socialised, and embodied) dispositions, routinely enacted individual practices, and the social fields (e.g. political, institutional, familial, cultural), and structuring of capitals (economic, social, symbolic, cultural, etc.) that mutually co-construct these.

This thesis provides the first comprehensive review of the limited but emerging ecological habitus literature to date, revealing that the concept is applied in two different ways. Primarily it has been used as a normative descriptor of existing ethics and lifestyles that represent or strive towards ecologically sustainable aspirations, and it has similarly been suggested in the literature as a tool for mapping out and envisioning potential pragmatic pathways towards such sustainable ways of life. The second scholarly application of ecological habitus is as a neutral (i.e. positivistic) lens that can describe the full spectrum of socio-ecological relationships (e.g. unsustainable to sustainable) and it is proposed as a novel research tool in this capacity, aligning with Bourdieu’s similar use of habitus as a methodological/theoretical tool. Additionally, the analogous concept of a ‘habitus of sustainability’ was identified in this review, having previously been siloed completely from other ecological habitus scholarship in its own strand of Bourdieuan sustainability education-research. Alongside this, I incorporate ‘ecological capital’ (different forms of ecologically salient capital such as knowledge, skills, etc.) as part of ecological habitus, presenting a novel conceptualisation within the ecological habitus literature. Drawing on my understandings from this review and my Bourdieuan reviews, I re-interpreted the components of ecological habitus into a novel, visual, cyclic-model to portray the process of co-construction and reproduction that ecological habitus involves.

Applying this model to my analysis of the interview data and ongoing literature reviews informed my more in-depth and nuanced conceptualisations of the constituent parts of ecological habitus,

but also highlighted that the ecological habitus model/theory itself had two significant shortcomings:

1. The first was the need to incorporate natural capital as a core component of ecological habitus. Natural capital is Earth's stock of natural resources and elements (e.g. minerals, plants and animals, landforms, etc.), which as collective, in situ systems generate ecosystem services (e.g. clean air, fertile soil, and fresh drinking water). Any consideration of strong-sustainability necessitates consideration and assessment of natural capital (in terms of quantities, configurations, and emergent properties). Moreover, when conceptualising ecological habitus, natural capital has a variety of unique characteristics that make it distinct from Bourdieu's social, economic, cultural, and symbolic capitals. These include its fundamentality to survival (e.g. plants create oxygen we need to breathe), its inescapably shared components (e.g. people and other biophysical systems share the oxygen atoms we breathe in and out), the pervasive effects of enrichment (e.g. planting a tree) which can benefit both the supplier and other biotic forms (e.g. providing further shared oxygen), and its ability to reproduce and adapt without human input (e.g. plants can grow without human labour).

I argue that natural capital is furthermore embodied directly by people and that it can self-dispose people to developing other forms of ecological capital (e.g. bird watching could contribute to ecologically salient care, identity, knowledge, or skills), as well as being structured by individual practices and larger social fields. This addition responds to recognised holes in Bourdieuan theory with reference to contemporary post-anthropocentrism by synthesising natural capital from ecological economics and ecological capital (from education) into the corpus of ecological habitus theory.

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2. The second elaboration to ecological habitus that I make is exposition of ecological reflexivity (ER). Despite reflexivity being a core component of Bourdieu's habitus this concept is discussed only fleetingly in the ecological habitus literature, and casually in other sociological, anthropological, and Bourdieuan environmental-scholarship. As a parallel to Bourdieuan reflexivity, I argue that ER can describe each point on the following spectrum (and other variants in between):

- Intentional/critical contemplation of the socio-ecological nexus with more or less sociological imagination (e.g. as to dispositions, social fields, capitals, doxa, and the co-construction and reproduction of these, etc.) and ecological imagination (e.g. as to natural capital; and ecosystem functions, processes, and services) to inform this process;

- Conscious/periodic contemplation of the process that is either imposed or intentional; and
- Subconscious/routine/embodied forms of ER that occur within ecological habitus at all times, describing the embodied reflection of ecology within people and society and people's pervasive effects on ecosystems from molecular to global scales. This form of ER occurs whether people realise it or not.

Intentional and critical ecological reflexivity (abbreviated here as 'critER') is the type most referenced in any scholarship and is widely acknowledged as a skill that can be cultivated. I argue that it can be applied as an ecologically-salient parallel to Bourdieu's use of reflexivity as a conceptual tool (with or without reference to the cyclic framework that I developed) for:

- Systematically describing and understanding the components and interactive dynamics of existing ecological habitus (e.g. of a person, collective, or research narrative);
- Critically evaluating the sustainability of ecological habitus (including practices, fields, etc.) and identifying and/or diagnosing socially embedded barriers to improving this; and
- Framing and/or prescribing potential day-to-day practices that could provide starting points for overcoming these barriers, towards the creation of sustainable ecological habitus.

This addition cements the place of reflexivity as part of ecological habitus and fills the gaps across a variety of literatures where the concept is casually used but not linked to Bourdieuan conceptualisations or otherwise theoretically defined. I furthermore presented a Bourdieuan-derived biographical cascade of ecologically reflexive questioning as an example of how intentional ecologically reflexive questioning can be used methodologically to systematically describe ecological habitus of self, providing a brief demonstration of what this could look like based on my own ecological habitus.

These two elaborations enhance the capacities of ecological habitus as a theoretical and methodological tool, allowing for nuanced and robust conceptualisations of how and why socio-ecological relations persist (e.g. in unsustainable forms) or change (e.g. towards or away from sustainability) within individuals and across society, and how they might be intentionally changed towards sustainability over time. Furthermore, with these elaborations, the ecological habitus framework that I developed and applied provides a flexible and transposable research tool. This can:

- Inform research into individual elements of ecological habitus (e.g. forms of capital, or individual practices);
- Underpin holistic research that spans various scales (e.g. temporal, spatial, social) including the broad scale of cities;

- Circumvent obstructive disciplinary or paradigmatic dichotomies (e.g. disciplinary silos that plague sustainability research, division of humans from nature, social versus individual change, nature versus nurture, etc.);
- Link broad socio-ecological problems and solutions with what people do in their everyday lives; and
- Be applied to formulate logics of research questioning, develop assessment tools, identify points of sustainability intervention, etc.

The framework builds on the small body of published literature on ecological habitus, and responds to specific challenges therein for researchers to develop and apply ecological habitus as a research tool for conceptualising and analysing socio-ecological relations and identifying where and how change towards ecological sustainability might be made, and by whom. My application of ecological habitus to describe sustainable and unsustainable variants and how these could be intentionally changed responds to these challenges directly and addresses a broader research scope than prior studies (i.e. addressing whole city societies). Additionally, my developments contribute to the expanding body of work that continues to apply and adapt Bourdieu's social concepts for research into contemporary (in this case socio-ecological) concerns.

Conceptualisations and analysis of the interview results through the lens that this theoretical model provided facilitated my critical discussion and construction of three backcasted pathways to sustainability in Western cities presented in Chapters 8-10, thus responding to Objective 3 of this thesis, and contributing to Objective 4, as discussed next.

11.5 TOWARDS THE PRAGMATIC CREATION OF SUSTAINABLE ECOLOGICAL HABITUS IN CITIES

Objective 4 was to pinpoint practical everyday changes that individuals within Western cities could undertake to contribute strategically to an ecologically sustainable future. The ecological habitus framework for change that I developed (in combination with degrees of sociological and ecological imagination that I applied and which grew as part of this research), emerged during the final, thematising stages of my analysis of the expert interviews. Primarily this helped me to understand and conceptualise how unsustainable ecological habitus is reproduced normatively and practically by people in cities today, and to envision how changes in the present could flow through the habitus cycle to potentially create more sustainable ecological capitals, dispositions, practices, fields, reflexivities, and overall habitus in the future.

In line with the aim of my research, I also focused on the 'pragmatic backbone' (Figure 11) of my ecological habitus framework, seeking solutions that could begin with everyday change, while

strategically contributing to the creation of more sustainable ecological habitus at a broader scale. The three backcasted pathways to sustainability in Western cities that I constructed through analysis of the expert interview data sit along this backbone (shown in green in Figure 18, below). Each contributes to sustainable ecological habitus by: developing **ecological capitals** (including conscious/critER) within city authorities (while overcoming disciplinary silos; Chapter 8); enriching **natural capital** in city environments (Chapter 9); and increasing sustainable ecological **practices** in the city mainstream, guided by my SEAs inventory (Chapter 10), respectively. These are complementary and mutually-influential changes and each has flow-on effects throughout the ecological habitus system, influencing individuals' dispositions and social fields as represented in Figure 18.

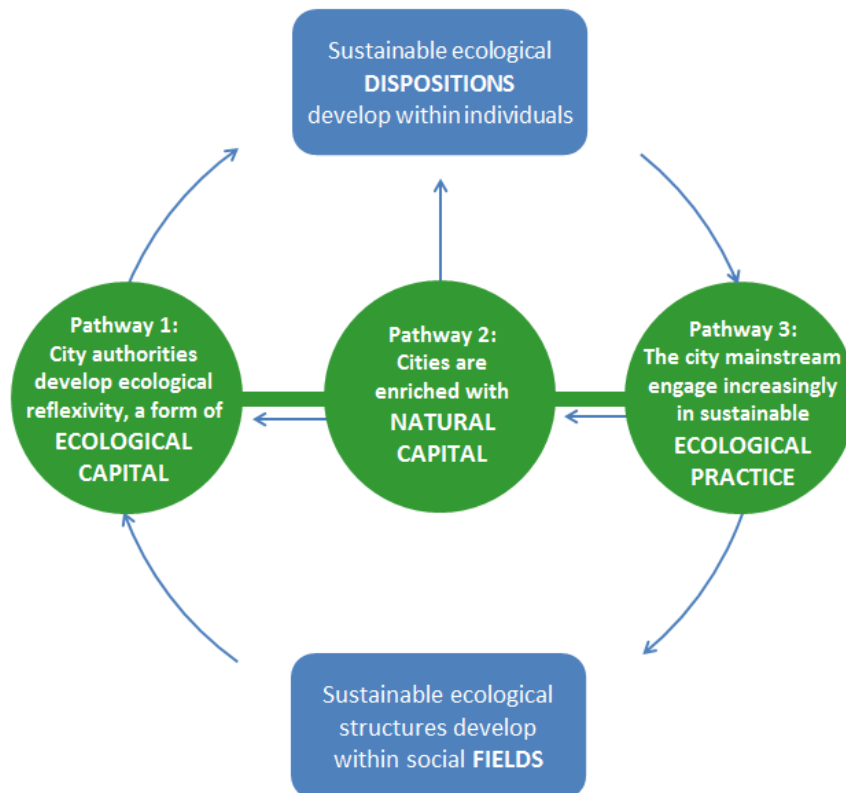


Figure 18: Cyclic model of ecological habitus depicting how change along the three pragmatic pathways could collectively strengthen the backbone of sustainable ecological habitus in cities. Arrows indicate the most immediate ways that factors influence one another (e.g. changes to practice always occur within and inform social fields, social fields always structure ecological capitals - but not necessarily natural capitals, capitals inform an individual's dispositions, and these inform their practices). The arrows also 'flow-through' each factor to the others (e.g. changes to practice influence social fields, but have additional flow-on effects to capitals, dispositions, etc.).

Each pathway was constructed from topics generated through grounded analysis of the interview data, and was framed by ecological habitus. Each proposes practical everyday actions that could contribute strategically to overcoming existing barriers and creating change towards aspirational sustainable ecological habitus in cities. Framed by ecological habitus, these three pathways respond to Objective 4 of this thesis.

The first pathway focused on the critical role of top-down leadership in creating ecologically sustainable cities. The interview analysis found one barrier to effective socio-ecological leadership is the disciplinary siloisation that pervades academic, professional, and governmental institutions. Siloed thought and practice within these institutions can prevent individuals with authority (e.g. educators, researchers, policy-makers, local government, architects, planners, and designers) from developing holistic/ecologically-sensitive understandings, practices, and corresponding city leadership capacities. Top-down leadership strongly influences the type of ecological habitus that is supported within cities. Authorities in institutions are prospectively primed for the role of critical and transformative change, with their role-required capacities for reflective thought (although this is not necessarily ecologically focused), access to capital resources, and influence when deploying these to shape cities (e.g. through city design, infrastructure, policy, curriculums, and economies).

A series of tangible everyday practices could support individuals to overcome disciplinary silos. In particular, collaboration across ecologically salient disciplines could foster an accordant, ecologically salient form of interdisciplinarity, which would improve leaders' capacities for critical ecological reflexivity (i.e. intentional and critical consideration of the interconnections between people and natural capital). Such collaboration could, for example take place as part of teaching, committee work, design and communication of research, and/or applied projects or programs; and incorporate leaders from different fields, reflexive interdisciplinarians, people from complementary or divergent disciplines, community and indigenous groups, underprivileged groups, and/or those most impacted by socio-ecological change. This could begin with small-scale, convenient approaches (e.g. informal conversations), to initiate learning of diverse terminologies and, importantly, the perspectives underlying these. It could also be spurred by visiting or work on collaborative projects or initiating and participating in collaborative meetings. These could further be facilitated by the construction and application of interdisciplinary models (e.g. my ecological habitus model), metrics, language, and approaches; and could be supported logistically by technology, and engagement with various funding streams.

I furthermore presented a tailored logic of ecologically reflexive questioning that could provide a systematic way for authorities to undertake such reflections on their disciplinary-ecological-habitus, its sustainability, and the effects of siloing in particular. Ideally, these practices would help to develop sustainable ecological habitus within city authorities themselves, and promote

corresponding leadership practices that could initiate top-down change, through policy, education, design, management, etc., fostering sustainable ecological habitus within city societies at a larger scale. This pathway could be supported by the other two (see below), for example by the mainstream becoming more engaged in sustainability and exercising ecological democracy to influence the sustainable management of their own institutions, or voting for sustainability within city government, etc. My interdisciplinary conceptualisation of this pathway, drawing on the interview data, brought together literature around leadership in sustainability, in cities, and in institutions; interdisciplinarity itself; silos, particularly disciplinary silos; ecological reflexivity; and collaborative practice, highlighting the significance of higher education to the conceptualisation and potentially the creation of sustainable ecological habitus in cities.

The second pathway focused on the significance of natural capital within cities. The interview analysis showed that a lack of equitably accessible natural capital with qualities that provide for meaningful and constructive human-nature interactions (i.e. those that collectively contribute to ecological capitals, or otherwise influence habitus) in some cities can lead to a distancing of nature from people's everyday lives and even bio-phobia. This potentially weakens the ability of city dwellers to initially develop or maintain sustainable ecological habitus. Lack of natural capital can further preclude the direct benefits that people can gain from nature (physical, mental, emotional, etc.), and reduce cities' ecological self-sufficiency and resilience. The experts advocated for comprehensive and equitable enrichment of cities with natural capital, at a variety of scales and diversity of forms (e.g. street tree networks, urban farms, riparian planting). Such nearby-nature would enhance cities as biophilic living environments; support the growth of 'ecological capitals' (e.g. ecologically salient skills and knowledges); and potentially routinise sustainable ecological habitus within the mainstream. This pathway could be supported by the other two, if the mainstream of city people became engaged in nature enrichment at everyday scales, and/or city authorities planned and invested in nature enrichment at broader scales. Drawing on the interview data, my interdisciplinary conceptualisation of this pathway brought together literature from ecological economics regarding natural capital, ecosystem services, and ecological footprints; and literature on nature's inherent value including concepts of biophilia and bio-phobia, nearby nature, the extinction of experience, and the development of ecological identity, imagination, and ethics, which highlighted the significance of these to conceptualising and potentially creating sustainable ecological habitus in cities.

The third pathway responded to the limitations of some existing approaches to creating ecological sustainability (e.g. top-down regulation and more radical approaches in 'green-niches') in terms of engaging city dwellers from mainstream city fields (i.e. those not normally focused on sustainability, such as various occupational, cultural, sporting, or religious fields). While existing sustainability engagement approaches are valuable, some can be out of touch, polarising, negative, or radicalised, thus inciting counterproductive responses such as disengagement, apathy, fear,

guilt, etc. Small ecological actions (SEAs) offer a potential way to make sustainability ‘sticky’ (i.e. personally appealing, practically achievable, and more likely to become routinised in practice) in a greater variety of city dwellers, and would aspirationally engage a broader spectrum of city people in sustainable practice. Practicing SEAs within everyday life (e.g. obtaining food, water, and energy, and disposal of waste) could create change by increments, and begin to shift what is viewed as ‘normal’ in the mainstream, with flow-on effects towards sustainable ecological habitus as a whole in these fields. Implementing an array of self-selected and therefore sticky SEAs could begin pragmatically with an inventory approach, initiated by a facilitator with social, cultural, symbolic or other distinction in the field and could build positively on existing practice, while introducing new options for incremental change. I presented a preliminary example of a small ecological action inventory based on various everyday dimensions of ecological habitus that could be employed for this purpose. This pathway could be supported by the other two, as top-down improvements to sustainability infrastructure (e.g. public transport) could better enable people’s sustainable practices, and enrichment of natural capital in cities could directly dispose people to nature-care, recognition of the benefits of ecosystem services, etc. My interdisciplinary conceptualisation of this pathway, drawing on the interview data, brought together literature on top-down structural sustainability, ecological democracy, green niches, behaviour change, everyday practice, positive psychology, and motivational interviewing, highlighting the role each plays in conceptualising and potentially creating sustainable ecological habitus in cities.

Collectively, these pathways present an interdisciplinary response to the question, how then *could* we live, to create sustainable ecological habitus in future cities? In responding, this thesis analysed and synthesised the insight and foresight that the 25 experts proffered within the interviews, information published by the experts within their own research and theory, and the relevant works of many others, cited herein. As intended, the endpoint of my research was the presentation of a series of aspirations for sustainable cities of the future and pragmatic pathways that could begin in the present and work around existing barriers towards realising these aspirations. These go hand in hand with the versatile framework that I developed to inform and frame these pathways, and which has potential to inform the generation of still further solutions. Good research is said to open more doors of inquiry, and the theory, method, and topical results of this thesis set interesting directions for future research. Moreover, enacting the three pragmatic pathways presented here in the real world has potential to create genuine change towards sustainability. Next, I outline some of the interesting future research directions that I can see potentially sprouting from the foundation of this thesis.

11.6 RECOMMENDATIONS FOR FUTURE RESEARCH

The pragmatic pathways towards sustainable change in Western cities that I propose could be directly applied to research as well as offering scope for further theoretical development. This could be undertaken through action research, case studies, (auto)ethnographic approaches, design-fiction, or other means, and could include application, testing of efficacy, analysis, improvement, or revision of:

- The list of recommended practices to enhance collaboration within city institutions. This has potential to inform the everyday practices of city authorities with consequences for top-down sustainability in cities;
- The list of ways to enrich cities with ‘natural capital’. This could inform understandings of how the ecological habitus of city dwellers (and the sustainability of this) is informed by natural capital in everyday environments; and
- The SEA inventory to enhance sustainability engagement in the city mainstream. This has potential to inform people’s everyday practices in the real world and for the development of ecological capitals, and wider ecological democracy.

As research tools, each of these could be used to undertake empirical research. For example, comparative case studies between similar individuals or across similar groups (e.g. different institutions, organisations, cities, etc.), between more and less sustainable counterparts, or between sustainability at baseline levels and post-intervention. Additionally, quantitative surveying and/or further qualitative interviewing of experts (including city authorities), mainstream city dwellers, those involved in ‘green niches’, or other relevant agents of socio-ecological change could be undertaken to test the framework’s ability for generalised application to the pathways presented here (including identification of current barriers and practical actions for overcoming these). This might reveal further potential practical solutions, and/or inform refinement of my ecological habitus model.

This research also synthesises a diversity of topical literatures specific to the three pragmatic pathways (e.g. positive psychology, motivational interviewing, reflexive practice, informal collaborative practice, and immersive ecological education). Combined, these topical literatures could:

- Be further drawn upon in action research to inform testing and revision of the above research tools;
- Engage the parallel, complementary, or contrasting perspectives of other literatures noted herein to inform theory and methodology developments within topical fields (e.g. ecological economics could inform other Bourdieuan theorising and research); and
- Engage the collective expert insight, backcasting, and Delphi methodology, and ecological habitus theory approaches to inform further topical research into socio-ecological change.

The theory development in this thesis drew on Bourdieuan scholarship to strengthen conceptualisations of ecological habitus. Aspects of this theory could be applied and developed through further research. In particular, the ecological habitus framework, combined with critER could be engaged as a methodology, analytical tool, and theory to inform further socio-ecological research, for example to:

- Generate backcasted pathways towards sustainability, introducing a new theory for this purpose into futures research;
- Assess and manage sustainability transitions, providing the normative-positivistic combination needed for this purpose;
- Describe, analyse and potentially diagnose barriers and solutions to creating change in the full spectrum of sustainable to unsustainable variants of ecological habitus, especially in the under-explored fields of city authorities, the city mainstream, and other fields where sustainable ecological habitus is not the focus;
- Describe and analyse significant historical changes in ecological habitus (towards or away from sustainability) in order to foresee and accelerate future change;
- Describe macro-scale socio-ecological change (historical or current), including economic, political, or educational interventions and revolutions, or potentially contribute to creating aspirational forms of these; and
- Describe how manmade elements of city environments (e.g. public transport, renewable energy, and waste infrastructures) inform and/or practically enable sustainable ecological habitus day-to-day and how these might be changed to better support sustainable ecological habitus in cities.

Such research could again be undertaken in myriad ways (e.g. ethnographic or case study approaches) and would inform development of ecological habitus as a theory, while simultaneously providing a new lens through which to examine socio-ecological phenomena. The cyclic model of the ecological habitus framework and/or a biographical cascade of ecologically reflexive questioning exemplified herein could provide the basis for research instruments for this purpose.

The interview method applied in this thesis drew together strands of backcasting, the Delphi method, qualitative interviewing, and expert interviewing, and presents a detailed description of this process. The work focused on sustainability in Western cities and engaged a diverse, but not exhaustive array of experts from various disciplines related to this. Consequently, a similar interviewing method (albeit conducted through the habitus of a different researcher) could therefore be applied to explore the insights of additional experts with reference to the same (or other) realms of sustainability. This could take the form of a similar research project, with a different sampling frame at the outset, including, for example:

- Experts from alternative disciplines and combinations of disciplines, as derived from appropriate literature review, additional snowball sampling, or from the established perspectives of a given researcher;
- Experts from alternative institutions to those focused upon here such as transnational, governance, conservation, business, health, legal, media, childhood education, cultural, indigenous, non-governmental organisations, or religious institutions;
- Experts from other automobile-orientated Western countries such as New Zealand or Australia, Western countries that focus upon and apply principles of ecological sustainability to greater degrees (e.g. Scandinavian nations), or experts from developing countries; and
- Experts in rural, agricultural, suburban, community or other geographies of sustainability; or
- Other agents of socio-ecological change that are experts in their own realms (e.g. cultural elders/leaders, activists, certain celebrities, philosophers).

Such research has potential to identify further pragmatic pathways that could strategically leverage ecological sustainability in Western cities (and beyond), or to provide additional emendations to the ecological habitus framework. These might strengthen its capacity as an interdisciplinary, methodological and theoretical research tool, and/or potentially present critiques and improvements to the method itself.

Finally, this research generated a volume and quality of data in the form of interview recordings and transcripts. Alternative analyses of this material are possible and could, for example:

- Apply different theoretical lenses (e.g. engaging systems theory, original Bourdieuan theory, or other multi-level theories of change) to the data to identify alternative conceptualisation of how change could occur in Western cities;
- Seek different research outcomes from the data (e.g. summarising the interviews for dissemination, comparing the different experts' answers, or conducting discourse analysis) as part of research into interdisciplinarity, silos, and/or the development of ecological habitus in experts themselves; and
- Analyse the data on unintentional, uncontrollable, unworkable, or perceivably unrealistic modes of socio-ecological change as part of research into these phenomena.

Finally, ecological habitus-based analysis of the data could be conducted through another researcher's lens of ecological habitus. The outcomes of this could be valuable in their own right, and/or could be compared and contrasted with, or used to complement my own outcomes, potentially adding to the pool of prospective practical sustainability solutions and/or providing for analysis of the role of the researcher's habitus in applying such a framework.

11.7 CLOSING STATEMENT

This was an ambitious research project, as I have come to realise, and as some of the interviewed experts attested to me. However, as commonly experienced in research, I set out in the beginning thinking it would be relatively straightforward. I imagined that the final outcome might be a set of factors, perhaps a checklist compiled from the interview data, which could potentially contribute to transforming unsustainable cities. Indeed, the experts provided material that could inform many such checklists, some of which I have constructed and presented within this thesis.

However, as my developing comprehension of *habitus* and ecological *habitus* revealed to me, the social (including political, economic, etc.) and ecological contexts in which ecological dispositions, practices, reflexivities, and *habitus* occur makes it impossible for many sustainable practices and supporting paradigms to be contemplated on a universal scale (or even generalized among Western cities). Some practices, such as burning fossil fuels, are universally damaging, but their context is the key to understanding why they occur, and significantly, to changing them. Furthermore, as many of the interviewed experts asserted, it is likely that all of the solutions that are required to solve today's socio-ecological problems already exist. The sticking point involves conscious and subconscious resistance to enacting these solutions.

Thus, responding to my research aim could not just involve the compilation of ideas, but also required a socially and ecologically contextualized way to frame these ideas and to link them to ways that they could be enacted within everyday life and the inevitably complicated realities that this entails. I could not find any such framework within the broad literatures that I reviewed. Ultimately, my development of the ecological *habitus* framework provided an effective heuristic device for achieving this, but this did not come without a protracted and non-linear process of iterative adaptation.

Crucially, ecological *habitus* offered me a way of understanding specific and contextualized socio-ecological phenomena using general principles. Ecological *habitus* is scalable (e.g. to individuals, families, institutions, or cities), and transposable as a socio-ecological research instrument (e.g. it could be applied to different types of city research, as evidenced by some previous applications that examine health, consumption, social movements, recreation, etc.). These qualities enabled its engagement in my research as a conceptual and methodological lens with the capacity to integrate the diversity of disciplinary and experiential terminology, insight, foresight and suggestions for iteratively transformative practice that came from the experts, the literature, and my research as a whole. However, on a personal level, the true value of developing this framework is that I can carry it with me into the future as a conceptual and practical tool that will inform my professional life, the practicalities of creating an ecologically sustainable lifestyle for myself, and ideally for inviting and enabling the same in others around me.

This research does not change the world, but it does pose and respond to important questions in new ways. The take-home message from my PhD as a whole is that current approaches to creating ecological sustainability are valuable, innumerable, and increasing worldwide, but with careful examination there is always room for progressive innovation, adaptation, escalation, amplification, and acceleration of sustainable practices, and that all people, especially those in Western cities, have an ethical responsibility to take notice and become part of these solutions. What was most exciting for me within the interviews was the number of examples that the experts provided, from both their professional perspectives and their worldly personal experience, which demonstrated how much constructive change is already underway. These examples contributed to my optimism and also my research outcomes, which demonstrate that there are many practical everyday ways to begin creating change, with potential to overcome existing barriers and realise the sustainable ecological future that we are increasingly aspiring to, and collectively require. As my research illustrates, we can all have a hand in creating such change, and we can begin today.

Kei te haere tahi tātou; me tīmata tātou ināianei.

Mā tini, mā mano anake, kia tiaki tātou i tenei Ao.

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APPENDIX 1

EXAMPLES FROM MY OWN ECOLOGICAL HABITUS

Here I present some examples of my own ecological habitus, with a less formal tone. I follow a descriptive, biographical cascade of questioning, beginning with examples from my childhood experience (as the foundation of an evolving habitus). I describe some factors that were formative for me during these early years, and offer some possible alternatives (imagined and observed), to demonstrate the variety of situations that can be involved in the generation, development, reproduction, and change of an individual's ecological habitus. I also offer some brief examples of how these formative experiences continue to inform my ecological habitus, and some of the factors that influence my practices as an adult. I respond, relatively briefly, to these questions:

1. What were the normative ecologically relevant dispositions and practices in your formative social fields?
2. How did these formative fields contribute to the construction of your own ecologically relevant dispositions and practices? For example, to what degree are these dispositions reproduced or transformed in your current ecological habitus?
3. How are your ecologically relevant dispositions and practices supported or challenged by the social fields (e.g. family, friends, work, or clubs) that you now inhabit and capitals that you hold?
4. How do your dispositions and practices contribute to the construction of ecological habitus in these social fields, and how might this affect ecological habitus of the field into the future?

An integral modality of critical ecological reflexivity, or 'critER' (discussed in Chapter 6 and 7) is the exploration and mapping of the various ecological components of an individual or collective's habitus (e.g. the dynamics between social field, individual dispositions, capitals, and practices, and the way that these are reproduced, reflected on, and adjusted over time). Moreover, an inventory of individual ecological sustainability that sought to describe, normatively evaluate, and potentially change ecological habitus could also be framed by such questions. The examples presented here exemplify (based on my own life) how such exploratory questions might be answered, and are reflexively compared to (imagined and actual) alternative potentialities of ecological habitus.

These questions can be reflected upon with increasing depth and complexity as understandings of human-ecological interactions and the dynamics of ecological habitus grow. During the last few years, as I learned about new facets of habitus, I found myself framing day-to-day activities in Bourdieuan terms. Similarly, when I learn of ecological plights, no matter how distant, abstract, or seemingly unrelated they are to my life, I cannot help but think through what dialogic relation there might be between them and me. The examples presented here are not exhaustive, but are

intended to exemplify some of the factors that can contribute to ecological habitus, and to offer a little background of my own habitus coming into and proceeding through this research.

1. What were the normative ecologically relevant dispositions and practices in your formative social fields?

Kasper's (2009) proposed ecological life dimensions, or the socio-ecological variables of the SEAs inventory (Chapter 10) provide a useful way to think through what contributes to ecological habitus. Correspondingly, here I discuss habitat, food and water, energy, waste, life activities, and culture and values.

Habitat (type, location, home etc.)

I spent my childhood in the far north of New Zealand, arguably one of the most beautiful places on the planet, embedded in natural landscapes and Māori culture. My first few years were in the Waipoua River valley amongst one of the last remaining forests of ancient kauri in the world. The narratives of this time, woven for me by my parents and the Māori elders whose place it is, were repeated to me often through my childhood, and depicted the forest as my foundation. This continues to inform my perception of people as part of nature, rather than separate from it, as discussed further below.

Most of the rest of my childhood was based on the south coast of the Hokianga Harbour. We lived on a hill overlooking the harbour, just a stone's throw from the beach. My brother and I would walk home from school along sandy shores, and sometimes my teacher would take the restless class swimming in the sea of an afternoon. Countless weekends and summer holidays were spent in the rock pools in front of our house, looking for exceptional shells or lifting different stones to observe the crabs and tiny fish that darted about there, carefully replacing each stone afterwards so as not to harm the limpets or little snails clinging to their undersides. Comparing this to other possible landscapes and environments to grow up in (e.g. cities, agricultural landscapes, a desert), it is evident to me that this was formative to my ecological habitus.

Our home was a five bedroom, freestanding structure with remnant 1970s furnishings and a large garden. For me, the house was closely tied to the landscape, with views extending across the harbour and out to the heads, we would watch the sunsets, or the whales visiting, or the storms rolling in. The tiles on the roof would clatter in the most violent storms, and the windows would reverberate, bulging in and out with the air pressure. Despite being in a sheltered harbour, the weather on the west coast of New Zealand makes itself known. Sometimes we would have long power cuts, and other times it would rain for days on end.



The same stretch of the Waipoua River in 2013 (left) and 2016, showing a large Kauri tree that slipped in, and two juvenile kauri emerging through the canopy (background).

In forming my ecological habitus, the landscape and socialisations of my childhood were perceivably more ecologically salient than the type of house I lived in. However, imagining other potentialities highlights how varying conditions would generate diverse habitus. For example living in an apartment, house bus, short-term rental, terrace house, earthship, or a rural farmhouse. Imagining alternative scenarios helps to strengthen critER.



View across the Waipoua kauri forest, showing New Zealand tree ferns, flaxes, and a tui (*Prosthemadera novaeseelandiae*) in the foreground.



My home beach in the Hokianga.



View of the Hokianga harbour mouth at sunset showing North and South Heads.

Food and water (sources and compositions)

Water is obviously a fundamental of life, which (based on NZ's mistreatment of it lately) is contemplated too infrequently it would seem. Our house was connected to the municipal water supply (i.e. water was pumped and piped to the house), but many friends' houses relied exclusively on rainwater tanks or filtered river water for their supply. Storm damage could require repairs to these systems at times, and often in remote locations. Sometimes in the summer, when the tanks were low there would be a sign on the cistern reminding people not to waste flushes, and the rain gauge nailed to a pole in the garden was well visited. Such decentralised systems heighten reflexivity.

Many of the main roads in Northland were gravel at the time, and so supermarket shopping involved a half-day trip, and this seemed exotic to me as a child. Along with the socio-economic limitations of the area, this meant that many people grew or caught their own food (e.g. vegetables and seafood respectively). As vegetarians, our family relied on a large vegetable garden, where we (children) were allocated a plot of our own to grow things. We kept pet hens for eggs, and they would run around the larger garden to graze, and return when called in the evening for their dinner. All of the household food scraps would go to the hens and every now and then we would exchange our eggs with the neighbours for fresh broccoli or silverbeet. We had other pets too, a dog, and cats, and a pet goat who kept the grass down. We'd often visit friends who had farmlets nestled in the bush, with orchards and paddocks full of goats for milking and eating, or a few pigs or horses. Sometimes we would collect buckets of blackberries from nearby scrubland during the summer.

Again, I imagine that growing up with a supermarket in the street, or a thriving farmers market, or coming from a family of hunters, or takeaway eaters would contribute to a different ecological habitus, and very different reflexivities on the sources of my food and water.

Energy (including transport, electricity, renewables etc.)

Our house was connected to the municipal power grid, but many friends lived too remotely for this, relying instead on wood-fired stoves, small diesel generators, or occasionally a renewable power supply such as small, homemade hydro turbines in streams. There were few streetlights in the area, and this darkness made for excellent stargazing and contemplation.

Most people in northland got about by car. Without a car, it was difficult to get to most people's remote locations. Most children learned to ride a bike, and probably a horse, and observed the inner workings of car, tractor, or motorbike engines during repairs carried out at home. There was a school bus for some of the time we lived there. We could walk to some of our friend's houses, but along most of the main road (highway) there were not any footpaths for a long time, until my parents and classmates campaigned together to have one built along the road to the school.

I imagine that, as a child, having access to a sophisticated public transport system, or a suburban area full of SUVs, or a bicycle centric place, or a solar powered electricity system, or a lot of international flights would of course contribute to a different ecological habitus. Again, comparing this to my own habitus aids reflexivity.

Waste (rubbish, recycling, composting, sewerage etc.)

Our food waste went to the chooks or was composted, and the 'real' rubbish went to the 'tip'. The tip was a shipping container in the local quarry, with a ramp that you could drive up to throw your rubbish in on top. Sometimes people would see something in there that they thought was still

serviceable and would climb in to retrieve it. Sometimes things were left alongside the tip if people thought they might be recycled or useful to others (e.g. timber offcuts or bric-a-brac). When the container was full, a truck would come and take it away. There was no formal facility for recycling, but people made less of this kind of waste especially, because there were fewer opportunities to buy waste-generating products (e.g. no supermarket and few retail stores), and items were often reused as part of a ‘make-do’ attitude.

Again, our house was connected to a civic sewerage system, but in such a remote place, this could not remain invisible if something went wrong with the system. The fastest way to fix it was to dig it up yourself, which made waste disposal a much more evident process than having a city council contractor come to deal with problems. Some friends had long drop toilets, which offered the same first-hand and tangible connection to waste disposal.

I can imagine that a more sterile childhood environment, where rubbish is disposed of down shoots or tied up in layers of plastic and left on the curb to be taken away, and where there is comprehensive public infrastructure responsible for sewage disposal etc., would contribute to a different ecological habitus again.

Life activities

We played outside a lot, and were encouraged to study things closely, like ants, or starfish, or chickens, to ask questions, and to try and figure out why things happened the way they happened. As tertiary educated anthropologists, my parents encouraged inquisitiveness and careful observation. Our home was filled with many books of all varieties, so reading was a common activity, and we would frequently be directed to reference tomes for identifying the sea creatures, insects, or other ecological elements that we investigated.

We would take our toys into the garden, or built makeshift houses or towns for them out of sand, branches, grass, and anything else we could find. We created huts in the trees and tried to camp out in the garden overnight. Sometimes Dad took us camping in the ‘real’ (relatively remote and undisturbed) bush. He would impress us by calling in birds with a little whistle, and take us to see the koura (freshwater crayfish) in the springs at night with a spotlight. During one excursion we found an enormous divaricated bush full of stick insects and spent a few hours trying to count how many there were.

My Grandma is an artist who lived with us for some of my childhood, and I practiced a lot of arts and crafts, which were encouraged and supported by her and my parents alike. For a few years, we had a television, and when we were older, there was a computer in the house. Often we would watch David Attenborough documentaries.

I imagine that a childhood spent with console games, at skateboard parks, in shopping malls, or participating in organised and competitive sport, and myriad other activities would instil a different ecological habitus.

Cultural influence on values

As well as the ecological knowledge and sense of curiosity instilled by my family life, my ecological habitus was strongly informed by my formal education in different ways. Some of my preschool education was in a kohanga (Māori cultural and language preschool), and my primary education was in a bilingual unit, where I was immersed in Māori culture, traditions, and language, both at the area school, and on local marae (Māori meetinghouses).

Many of the waiata (songs) and other narratives woven into our learning depicted the relationships amongst people, plants and animals, and other traditional mythological entities, for example Tāne (god of the forest and birds) and Tangaroa (god of the ocean). In local legend, the Hokianga harbour mouth was said to be guarded by two taniwha (powerful and spiritual beings, sometimes monstrous and other times guardians), Arai-te-uru at the south head, and Niniwa at the north head, and locals of all ethnicities routinely referred to these and other local landforms using such titles. All of these Māori mythologies stem back to Papatūānuku (the earth mother), and Ranginui (the sky father), framing the place of humanity amongst nature.

Informally, I was also taught by Kate, an accomplished weaver and mentor, to weave flax in the Māori tradition, and with innovative contemporary styles. This included cultural practices around sustainable harvesting and caring for the source plants.

For me these frames of reference imparted a sense of reverence for ecological phenomena that was simultaneously locally rooted and universally entwined, and along with my secular home life, provided comprehension of the dynamic and interconnected nature of ecology, including, in part, the place of people and culture.

Other experiences, for example early education or familial worldviews aligned with other cultures, religious models, or frames of reference (e.g. technological, globalised, exclusively Western, or consumerism focused) would foster a different ecological habitus from my own, and offer points of reflection.

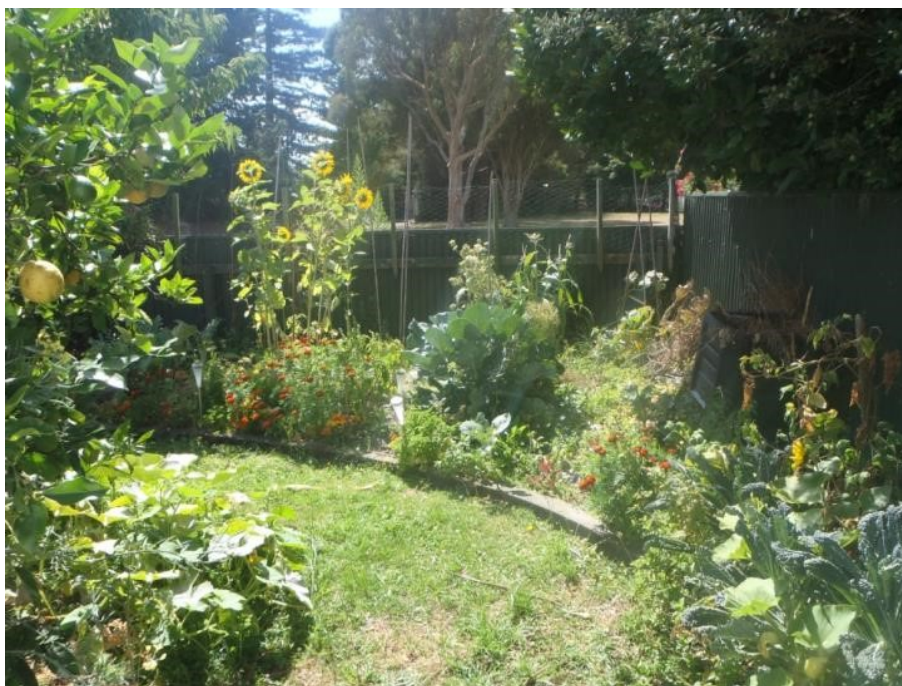
2. How did these formative fields contribute to the construction of your own ecologically relevant dispositions and practices? For example, to what degree are these dispositions reproduced or transformed in your current ecological habitus?

Despite my aspirations to forge my own destiny and identity, and episodes of adolescent rebellion, the influences of my family and early education fields remain core to my ecological habitus, as typified by Bourdieu. I bear an enduring sense of embodied connection to the landscape, which has been transposed onto other landscapes where I have spent time. Curiosity persists as a lens through which I view socio-ecological scenarios and life in general. The opportunities, described above, to witness how food systems work, the decomposition of waste, the quantity of water lost in a drought, plant and animal life cycles, the power of the ocean etc., are embedded in my habitus, functioning in my desire to understand the connections between things, and the mechanisms underlying them - hence my pursuit of tertiary studies in ecology. I also retain many of the intentional practices from my childhood fields as dispositions, such as vegetarianism, composting, gardening, weaving, and recording nature observations (mainly via digital photography now).

I can imagine that other people retain elements of their formative fields to greater or lesser degrees. I know of some people whose ecological habitus diverges completely from their parents, having been redirected by peers, or through re-evaluation as they became independent, as well as those whose parents have shifted and diverged due to life changes, or passed away.

3. How are your ecologically relevant dispositions and practices supported or challenged by the social fields (e.g. family, friends, work, or clubs) that you now inhabit and capitals that you hold.

My ecological practices have evolved over time with changes to social fields and environment. Living in more urban areas (e.g. towns/cities of 40,000 to 80,000 people) has enabled me to take up some practices that are considered ecologically sustainable (e.g. recycling, public transport, intentional/ethical consumption, and sustainability-orientated social groups), which were not part of my childhood experience. These changes necessitated novel decisions and practices, promoting reflexivity and development of my ecological habitus, which was furthered once more as I become more independent of the family field, and shifted into other social fields.



Summer vegetable garden at my student flat during my PhD.

My ecological sensibilities drew me to supportive social fields (e.g. ecology department of university and co-habiting with other vegetarians). Nonetheless, practicing my ecological habitus in these fields required novel practices and capitals (e.g. carpooling to classes, and learning about how to garden in Palmerston North's clay soils), and thereby also fostered reflexivity. Of significance was my newfound autonomy in food consumption practices. This was highlighted to me in the barrage of comparisons to my more and less ecologically sustainable peers, in addition to the emerging multitude of exemplars through social media, and led to much questioning and subsequent adjustment to my practices. For example, during my PhD my experiments of sustainable practice (of greater challenge and/or greater benefit because of a student budget) included foregoing the supermarket for extended periods, eating organic, eliminating plastics, zero waste ideals, various gardening experiments, participation in community food sharing, transient veganism, urban foraging, car-free living, and volunteering at charity shops. Some of these alternatives were eventually routinized and others are ongoing points of reflection.

The social fields I now inhabit largely support and have further developed my ecological habitus, but this is due to my selection of fields. Different fields - more or less considerate of human-ecological interactions or relatively disparate fields - would have different effects on a person's ecological habitus. I experienced many such comparisons when visiting America for my research. For example, the quantities of household and commercial rubbish that I observed in the USA exceeded anything I had ever witnessed in New Zealand, which is more sparsely populated for the most part.



Rubbish piled on a street in New York City.

While the cultures and societies of New Zealand and the USA are relatively similar on a global scale, the ecological systems are different. One of the most notable things to me upon arriving in America was the variety of trees and other plants (and later, animals such as hummingbirds, squirrels, bears, etc.), that I did not recognise. This contrast made me consciously reflexive of my well-developed, but largely overlooked capacity to recognise ecological elements in my home territory (a capital that was enhanced through my family, and formal education experiences, as described above).



A wild black bear foraging in the Shenandoah National Park.

Another thing that I was acutely aware of was the relative stability of the weather on a continent. Compared to New Zealand's island climate, which routinely brings four seasons in one day, the weather during my field research, while variable overall (e.g. snow, a heat wave, and a hurricane within four months), was predictable day-to-day, in a way that I had never experienced before. When Hurricane Sandy hit New York during my visit, I was surprised by some of the residents' (and the authorities') lack of emergency storm-orientated practices. For example, in the neighbourhood where I was hostelling, many of the shops were locked and barred (as usual, and also for security purposes), but their A-frame signage boards remained untethered on the streets, becoming projectiles in the high winds of the storm. Extreme and rapid weather events of this type are relatively unusual for New York (unlike snowstorms, which are common in winter), inevitably meaning that some residents are less practiced at responding to such events, and less reflective of the weather-orientated practices that might be required. This contrasted for me with experiences in New Zealand, where high winds are routine (e.g. in the capital of Wellington, described as the 'windy city'), and people are generally accustomed to responding appropriately as part of their ecological habitus.



Debris in the streets of Brooklyn after Hurricane Sandy

My preoccupation with weather forecasts was a factor of my ecological habitus that I had not been very conscious of before my field trip. However, spending time with foreigners in New Zealand has reaffirmed to me that this is unusual in many places. Once again, this stems back to my formative experiences that involved the very apparent influences of weather (e.g. in creating rainwater for drinking, effecting the garden or my capacity to walk to school etc.).

I also came across many interesting and compelling examples of city spaces that incorporated, celebrated, and compelled reflection upon nature; and facilitated sustainability. Notable among these were the infamous landscape parks designed by Frederick Law Olmsted. I visited seven of these (that I am aware of). My favourites were the Emerald Necklace in Boston, which is very well integrated with the surrounding neighbourhood, promoting pedestrian access, and was rife with wildlife; and Prospect Park in Brooklyn, New York, which (despite hurricane damage) was also bustling with people. I found the well-integrated museums, statues, monuments, and other recreational facilities within and adjacent to parks like these makes them inviting and interesting, and their popularity is testament to this. Of course, such parks are also carbon sinks, a building block of climate resilience, biodiversity banks etc. In places these features were highlighted, which was reassuring. Washington Zoo, for example had a strong focus in their information displays on conservation, and even with my intentionally developed knowledge of these issues, I found that there were new things to learn every day.



Early morning in the Emerald Necklace and mid-afternoon in Central Park



A wetland restoration project beneath the Brooklyn Bridge in New York; and a community garden in San Francisco.

The other thing that struck me the most in terms of American cities and sustainability was the ease and reliability of the public transport networks, especially in the bigger cities. For example in New York, it is obviously seen as being easier to catch the subway train than to drive a car around the island and into neighbouring boroughs. Staying in such large cities and experiencing this first-hand, alongside other perks of dense urban form (e.g. parks and cafes close by, well-developed cycle-ways, local-economy projects, urban farming etc.) reassured me that city life can be brilliant, concentrates the best parts of human development in many respects, pushes the boundaries of what is possible, is full of creativity, and is consequently becoming increasingly sustainable in many places.

4. How do your dispositions and practices contribute to the construction of ecological habitus in these social fields, and how might this affect ecological habitus of the field into the future?

Like everyone, my ecological habitus is always in dialogue with those in my surrounding social fields. If questioned (and sometimes if not), I share knowledge directly with those less-informed or less-reflective of human-ecological relations (e.g. flatmates interested in reducing waste), and more significantly, I am simultaneously and perpetually learning from the practices of others. With more ecologically sustainable individuals, or within groups with similar dispositions, some of my practices provide a mutually supportive normative contribution, and equally, my unsustainable practices contribute to the perpetuation of the status quo. I like to think that the minor conflicts of doxa instigated by some of my conscious practices can promote *critER* in other people, for example, rejecting plastic bags in shops, or bringing a cup for takeaway coffee. These practices are also normalised, and therefore socially supported in some of the fields that I inhabit. Finally, my academic life has focused primarily on socio-ecological relations, and my ambition is for this to have ever-greater effects on the ecological sustainability (and practices) of others. This has begun with my teaching roles in sustainability and ecology.

I can imagine (and observe) alternatives to my own position. For example, many roles such as parenting, city planning, and political leadership have vast potential to influence ecological sustainability within broad fields. Equally there are social fields where a person's habitus might be marginalised to a far greater degree than my own (e.g. those with less social, economic, cultural, symbolic, or natural capitals available), which would make them less inclined to embody or practice sustainable ecological dispositions, or to affect the field around them.

APPENDIX 2

SUPPLEMENTARY EPISTEMOLOGY AND METHODOLOGY

This is an environmental management thesis with an interdisciplinary target audience. Correspondingly, this appendix briefly outlines what the research goals of environmental management are, and how my research responds to these. I then review the future-orientated forecasting, backcasting, and Delphi methodologies that I employed.

ENVIRONMENTAL MANAGEMENT AND SUSTAINABILITY

RESEARCH

Environmental management is the management of socio-ecological interactions (Barrow, 2006; Randolph, 2004; Wiek et al., 2011), which include humanity's impacts on natural systems (e.g. positively through conservation, or negatively through pollution) and natural system's impacts on humanity (e.g. positively through resource provisioning, or negatively through natural disasters). In particular, the role of environmental management is to conceptualise perceivable problems (or threats) within socio-ecological relationships, and find strategic and practical solutions (i.e. interventional management strategies) to solve these (Barrow, 2006; Randolph, 2004; Wiek, et al., 2011).

Sustainability is the foremost goal (and unsustainability the dominant problem) of contemporary environmental management (Barrow, 2006), with sustainability research characterised by the complex, multi-scale, and evolving nature of the issues involved (as discussed in Chapter 1). Research in this field therefore requires researchers with an ever-evolving suite of conceptual and methodological competencies - a requirement unparalleled in more discrete disciplines. In Table 1, below I briefly outline how my research embraces these diverse research competencies, drawing primarily on Wiek and colleagues' framework (2011).

Table 1: Key competencies in contemporary sustainability research and how my research engages them.

Competencies necessary for sustainability researchers	How my research incorporates these competencies
'Anticipatory competency' to analyse and evaluate different future scenarios (e.g. continuation of the status quo, or change) (Wiek, et al., 2011); and 'craft' frameworks, visions, and narratives of sustainable futures and ways to realise these (Phdungsilp, 2011; Ratcliffe et al., 2006; Williams, 2010)	Takes a future-orientation, asking, 'How then could we live?' to envision more sustainable ways of life for future cities (where global populations are concentrated increasingly); and applies future-orientated methodologies.
'Normative competency' to understand the values, principles, goals, and targets involved in sustainability (Wiek, et al., 2011), including why unsustainability persists (Werlen, 2015), what sustainable alternatives might look like and how to transition from one to the other (Dreborg, 1996; Quist, 2007).	Emphasises normative considerations (i.e. why sustainability constitutes a 'better' future); and critically examines the reproduction of unsustainable socially embedded norms, and how sustainable change could be normatively seeded and spread.
'Strategic competency' to design and implement socio-ecological interventions, transitions and transformative strategies that contribute tactically to sustainability (Wiek, et al., 2011).	Strategically focuses on cities as locales where change would have pervasive benefits (because they are hotspots of population, politics, economics, resource use, innovation, etc.);

	strategically identifies barriers to change and practical actions to begin overcoming these; and focuses strategically on influential agents and pervasive factors of city life (natural capital and mainstream norms).
‘Interpersonal competency’ fostering collaboration, and participation with multiple sustainability stakeholders (e.g. people from different disciplines, institutions, organisations, and other backgrounds) (Wiek, et al., 2011), necessitating generalist and specialist understandings (Brown et al., 2015).	Includes 25 different experts from a variety of disciplines (sociologists, scientists, economists, designers etc.), and different sectors of city life (e.g. people from universities, NGOs, government, not-for-profits, and private enterprise).
‘Systems-thinking’ competency that comprehends the complexity of sustainability including the scales involved (geographic, temporal, political etc.), and unites environmental (Wiek, et al., 2011), economic (Costanza, 1992), and social (Mulligan, 2014) fields, circumventing institutionalized disciplinary limitations (Meyer et al., 2016; Schoolman et al., 2012; Sterman, 2012)	Synthesises interdisciplinary foundations of topical literature and insight from interdisciplinary experts into an ecological habitus model of socio-ecological systems that I argue can unite social, ecological, economic, and cultural pillars of sustainability, link everyday practice with global sustainability issues, and assess change or stasis through time.
Critical-reflexivity (Allen et al., 2017; Popa & Guillermin, 2015; Popa et al., 2015); adaptivity, and flexibility of approach including adoption and adaption of new approaches from other disciplines (Barrow, 2006; Randolph, 2004).	Engages critically reflexive and mixed-methods approaches and theoretically develops ecological reflexivity as a research method, drawing on diverse disciplines in both cases.

Thus, this research engages all key sustainability research competencies, responding to high order environmental management research concerns, to explore how sustainability could be created everyday in cities, with implications for broader change. Additionally, the ecological habitus framework that I developed and apply conceptually herein accommodates these competencies, providing a flexible tool for holistic environmental management research in the future. In the next sections, I discuss future-orientated epistemology and the specific methodologies I employed.

FUTURES RESEARCH

Environmental management is intrinsically future-orientated, incorporating methodologies for exploring future scenarios and developing interventionist strategies towards preferred futures (Barrow, 2006). A future-orientation is particularly important in the pursuit of sustainability, where solutions in the present are needed to protect (and ideally benefit) collective futures (Huutoniemi & Tapio, 2014). To this end, environmental management overlaps with, and can draw methodological insight from ‘future studies’, another interdisciplinary field where sustainability (Kemp, 1994; Varho & Huutoniemi, 2014; Wiek et al., 2006) and sustainable systems (Hjorth & Bagheri, 2006; Kay et al., 1999) are major foci. Future studies revolves around

revealing, constructing, and/or evaluating futures including “what can or could be (the possible), what is likely to be (the probable)” and/or “what ought to be (the preferable)” (Bell, 2004, p.73); and identifying “practical social actions ... to bring them into reality” (Bell, 2004, p.96). Popper’s foresight diamond (Figure 1, below) summarises approaches that are applied in this field, clustering them methodologically (Popper, 2008b).

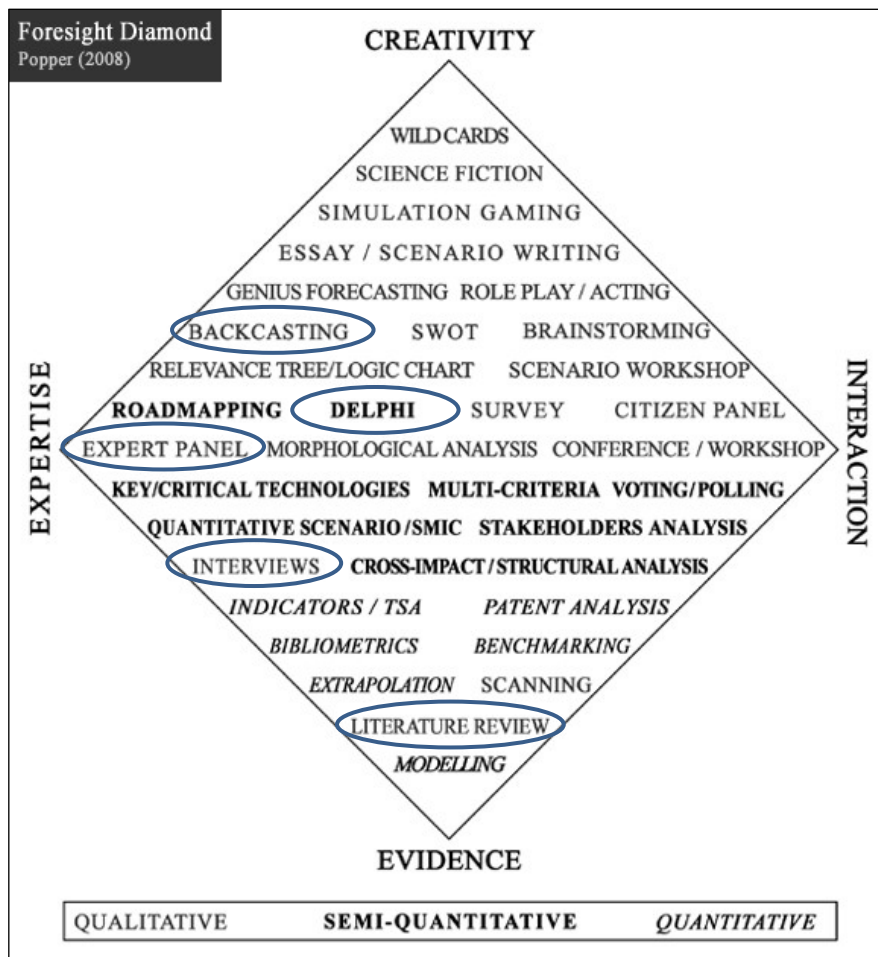


Figure 1: Popper’s foresight diamond (2008a) showing a spectrum of common foresight methodologies identified through a review (Popper, 2008b). Backcasting, Delphi, expert panels, and interview methodologies that I engaged are all situated near to the ‘expertise’ corner of the diamond. Methods I used are circled in blue.

Of these foresight methodologies, I used backcasting, dissensus Delphi (a qualitative adaptation of Delphi), and an expert panel/interviews, and also engaged diverse literatures (from the ‘evidence’ corner), in my exploration of options for creating sustainable Western cities. Most forecasting research engages a mixture of such methods (Popper, 2008b), and my selection stems mainly from the ‘expertise’ corner, at the left of the diamond, and the ‘qualitative’ category, as shown in the diamond’s key.

‘Expertise’ approaches contrast with and complement research for sustainable futures at the other corners of the diamond, including ‘interactive’ approaches such as qualitative case studies (e.g. Fien & Rawling, 1996), or ethnographic research (e.g. Hargreaves, 2008); quantitative ‘evidence’-orientated approaches such as modelling (e.g. Hawken & Steyer, 2017; Meadows et al., 1972) or bibliometrics (e.g. Schoolman, et al., 2012); and ‘creative’ approaches such as design fiction (Ilstedt & Wangel, 2014) or guided visioning (e.g. Meadows, 1994). Expertise-based approaches nevertheless employ the experts’ own evidence-base, and selecting a diversity of experts to include can garner insight based on other approaches shown in the diamond (e.g. experts’ own research). Creativity is one aspect that can be lacking in ‘expertise’ based approaches (Popper, 2008b), where established and technical knowledge dominates. This was countered in my research to some extent by selecting a diversity of experts including some specialising in design (Hood, 1997), and artistic city visioning (Register, 2002); and others with interests in creative sustainability approaches (e.g. gaming; Costanza et al., 2014). Next, I discuss the two specific methodologies that my research engages, which are backcasting and the dissensus Delphi approach. Expert interview methodology is covered in Chapter 3.

BACKCASTING

‘Backcasting’ (Robinson, 1982) is an interventionist forecasting methodology that is especially valuable when forecasts based on dominant trends (e.g. escalating resource use) predict undesirable futures (e.g. ecological and economic collapse) (Dreborg, 1996; Robinson, 2003; Robinson, 1988). Backcasting entails visualising a desirable (e.g. sustainable) future, then working backwards to identify barriers (i.e. ‘limiting conditions’) to achieving this vision, and designing a plan of action for strategically overcoming these, beginning with action in the present (Dreborg, 1996).

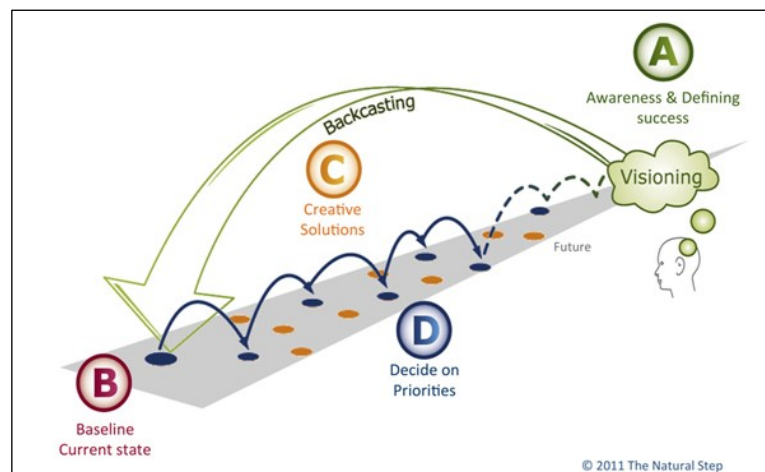


Figure 2: The ABCD backcasting model (TNS, 2011) showing how backcasting begins with a future vision, then works backwards to create a strategic pathway for realising this vision, beginning in the present.

This is an accepted environmental management approach (Barrow, 2006), and is depicted in the stylised ABCD model below (Figure 2; TNS, 2011). The ABCD model shows how backcasting begins with an aspirational future in mind before returning to consideration of circumstances and options in the present. This contrasts with traditional quantitative forecasting models that take data from the present (and/or past) and extrapolate these to predict and plan for the future (Dreborg, 1996).

Backcasting versus traditional forecasting

Backcasting is an interventionist forecasting approach, and provides benefits that are unavailable through traditional forecasting. Traditional forecasting relies upon large quantitative data sets and as institutionalised within economics, engineering, and the physical sciences where such datasets are commonplace (Robinson, 1988). Such forecasting is limited in that it can only facilitate planning for *probable* or *possible* futures. Traditional forecasting models typically rely on current knowledge and trends; variables that are measurable or have been measured, and are predictable over relatively short time periods; and extrapolations of trends that are linear or non-linear where predefined variables can be adjusted by specific agents (e.g. policy-makers regulating market prices). Backcasting, on the other hand, can facilitate planning for *preferable* futures and recognises the following:

- Dominant trends can be broken in diverse, complex, and relatively radical ways, by a diversity of agents (Dreborg, 1996);
- Knowledge, technologies, markets, societies etc., continually and reflexively evolve; and
- The future relies on complex assemblages of variables (Robinson, 2003), including those that are:
 - poorly-defined/un-defined and un-measured/un-measurable (e.g. biodiversity),
 - externalised (e.g. environmental externalities from markets),
 - unpredictable (e.g. natural or societal threshold effects),
 - intractable (i.e. there is no clear solution or ‘best’ option), and
 - occur across long-time horizons (e.g. biological evolution).

Backcasting: then and now

These listed capacities make backcasting especially relevant to foreseeing pathways towards sustainability, and it has been employed widely for this purpose. Backcasting began as a research method in the 1970s, responding to needs for sustainable future planning in the energy sector (e.g. Lovins, 1976), reflecting longer standing future-orientated approaches such as:

- ‘Visioning’ in business (Barrow, 2006);
- ‘Normative forecasting’ in technological fields (Quist, 2007); and
- ‘La prospective’ an established French approach for preparing feasible pathways towards desirable futures (Quist, 2007).

Early backcasting approaches were designed to inform energy and transportation policy (and still are; e.g. Akerman et al., 2000; Höjer, 1998), where investment in (and innovation of) infrastructure and/or technology at a given time enables or limits options for the future¹²⁷. These early backcasting fields engaged the same large and uniform data sets as traditional forecasting, but with desirable set endpoints and more creative modelling, to construct new and improved pathways into the future. Nevertheless, this included few variables and agents of change and therefore relied upon fairly fixed backcasting methods (Robinson, 1982; Robinson, 1988).

Contemporarily however, backcasting has been developed as a flexible *approach* (rather than a fixed method), enabling the pursuit of different aims, by different disciplines/research traditions, and with the input of different (e.g. qualitative) forms of data (Dreborg, 1996). For example, recent backcasting research has incorporated qualitative triggers of change (e.g. planning, regulation/policy, taxes, and behaviour change), a variety of change agents (e.g. including through participatory backcasting approaches; Carlsson-Kanyama et al., 2008; Neuvonen et al., 2014), and better recognition of sociological factors (e.g. socialised decision-making) as both perpetrators of the status quo, and potential ways to create change (Wangel, 2011).

Neuvonen et al., (2014) present a leading example of modern qualitative backcasting research, undertaken as part of Germany's 'SPREAD' sustainable lifestyles program (SPREAD, 2017). This is one of the first projects (run by a well-resourced consortium of researchers and organisations) to incorporate multiple lifestyle factors (rather than discrete consumption variables such as energy, housing, or transport) to forecast and scenario-building towards near term futures (i.e. by 2050) for cities that exist within planetary boundaries (Neuvonen, et al., 2014). Their research sought to incorporate both the dynamic macro-level drivers of reproduction and change (largely political, market-based, and technological), and everyday practices ('bits of lifestyle'), to envision how change could be triggered or accelerated, and who the potential 'gatekeepers' are for 'unlocking' a sustainable future (Neuvonen, et al., 2014). To do this, they engaged literature reviews, multi-level technological-change theory, several rounds of Delphi (expert) surveys, and workshops with varied participants. My research is a much smaller scale example, with nevertheless ambitious objectives.

Outcomes of backcasting research

The outcomes of backcasting are typically a series of visions for a preferable (often sustainable) future, and/or strategies for moving towards these visions (Dreborg, 1996). Envisioning desirable sustainable futures is an underdeveloped component of sustainability problem-solving (Meadows,

127. In Part II of the thesis, I argue that investment in natural capital, ecological reflexivity, ecological democracy, and other forms of socio-ecological capital similarly have the potential to open or close future options for sustainability.

1999) of benefit to society in general (Dreborg, 1996) and cities in particular (Ratcliffe, et al., 2006; Williams, 2010). Such visions provide ‘counter prognoses’ of what is possible (Dreborg, 1996; Robinson, 1988), new ways to frame problems (Robinson, 1988), and images of “what sustainability may be like” (Dreborg, 1996, p.826). In turn, these can:

- Broaden discussions, definitions, and conceptualisations of sustainability, altering people’s expectations in the present and for the future, and changing their perceptions about what options and solutions are available to them and correspondingly what their intentions ought to/will be¹²⁸ (Dreborg, 1996; Ilstedt & Wangel, 2014; Robinson, 1988);
- Raise awareness about the undesirable endpoints of current trajectories, and the tensions between everyday practices (e.g. of unsustainability) and long-term goals (Ilstedt & Wangel, 2014); and
- Link everyday actions and objects to future scenarios (Ilstedt & Wangel, 2014).

Dreborg (1996) asserts that humanity’s capacity to change is enormous but our perceptions of what is possible or reasonable are limiting. Therefore, knowledge (including favourable visions, current and future consequences of the status quo, and options for action) can influence the many actors that collectively generate societal norms (and socio-ecological consequences), potentially tipping them towards better alternatives or spurring whole new ways of solving problems (Dreborg, 1996). The results of such processes cannot be predicted by generating more data, but are reflexive, with change informing (and organically leading to) further change.

For example, Neuvonen, et al., (2014 – see above) sought to create a variety of alternative visions of sustainable future lifestyles, determine some of the ‘critical lifestyle triggers’ or ‘promising practices’ that could be mainstreamed to facilitate the realisation of these visions, and identify which people are the critical ‘gatekeepers’ for ‘unlocking’ such change; these backcasted pathways are presented in their article as a series of short paragraphs. Neuvonen, et al., consider that this variety of alternatives could appeal to a similar variety of people/demographics, with potential ‘emancipatory’ capacities (e.g. they could be developed as strategies or visioning tools) that could foster greater uptake of sustainable lifestyles (Neuvonen, et al., 2014).

Thus, the second potential outcome of backcasting is the development of a plan for bridging the status quo and the aspirational vision. In particular, identifying leverage points is valuable. These are “places within a complex system (a corporation, an economy, a living body, a city, an ecosystem) where a small shift in one thing can produce big changes in everything” (Meadows, 1999, p.1). Identifying such points, and developing strategies to leverage them can be an integral part of backcasting research and/or can necessitate further research, engaging any of the

128. This corresponds with Bourdieu’s “universe of possible discourse” (1972, p.169) – see Chapter 2, section 2.2.3.

forecasting methods presented in Popper's diamond model (Figure 1, above), including gathering further 'evidence' (e.g. of the visions' feasibility and/or consequences); 'participatory' processes (e.g. developing strategies alongside government or the public), including creative presentation of visions etc.; and further engagement with experts.

Responding to critiques of backcasting research

Accordingly, backcasting (as an exploratory and generative problem-solving tool) is considered to be valid (and should be assessed as such) to the degree that it enables the discovery or generation of potential ideas and solutions (Dreborg, 1996). Justification cannot be found in the form of a replicable scientific method; testing of hypotheses; observation of verifiable facts; generation of statistically significant results; or validation of existing theories (Dreborg, 1996). Nevertheless, a critique of qualitative forecasting approaches (whether normative like the dissensus Delphi and backcasting, or not) is that they cannot generate outcomes with the same confidence as quantitative approaches, such as traditional forecasts and deductive-nomological experiments (Linstone & Turoff, 1975). It is accurate that they cannot, but this is responded to with two common retorts:

1. All research into the future is inherently uncertain, and that even when successful, predictions by quantitative forecasts often fail when applied to longer-term scenarios (e.g. as technology and knowledge advance and conditions change in unpredictable ways) or when the other limiting factors discussed above (e.g. unmeasurable, unpredictable variables) must be considered (Dreborg, 1996). In environmental management, in particular, the precautionary principle can necessitate preventative intervention without proof of consequence (e.g. including variables that are undefined or unpredictable, long term), to mitigate against uncertainty and risk (Barrow, 2006; Dorney & Dorney, 2012; Randolph, 2004). In such situations, heuristic analyses (potentially mixing qualitative and quantitative information) like those provided by backcasting are required to guide decision-making.
2. The limitations of quantitative forecasts (see above) mean that a diversity of models are needed to address the diversity of problem scenarios that occur, and generate the different kinds of results that are needed for different purposes (Robinson, 2003). Accordingly, Dreborg (1996) sees the job of futures research (and science in general) as the continual pursuit of new ways of 'seeing' (e.g. seeing new opportunities for the future), and 'doing' (e.g. developing new methods of research), and a diversity of approaches for each enables flexibility and adaptability as we plan for and live into the future. Even within backcasting, the intention is to provide alternative options for how change could occur

and how the future could play out, rather than to generate a single ‘plan’, or ‘blueprint’ or to dictate a specific decision (Dreborg, 1996).

Approaches such as Delphi and backcasting are also critiqued for being ‘normative’ (i.e. subjective). Again, this is accurate, with both backcasting and forms of Delphi being explicitly subjective, normative, political, and value-orientated, but critiques of this are responded to in two ways:

1. All researchers are normatively socialised (e.g. within their discipline or institution etc.,) to favour certain theories, ideologies, data, and models (Robinson, 1988), which informs subjective decision-making (e.g. about what is worthy or interesting as a research topic, or what variables to examine) (Dreborg, 1996), and this in turn influences the possible and actual outcomes of research as a whole (Robinson, 1988). As discussed in Chapter 8 of this thesis, even experienced researchers can be unreflexive of their limitations and the various silos that they inhabit. Critiques of the value-based, political-orientation of backcasting are responded to similarly. Backcasting is often applied to finding potential ways to intervene in the status quo and solve societal problems, making the politics involved more evident and/or contentious. However, observational approaches or those that contribute to the reproduction of ‘business as usual’ are also political and values-based, but as doxic forms of research, are less likely to be recognised as such (Dreborg, 1996). Indeed, Robinson (1988) views the transparent normativity of backcasting as a potential way for futures researchers to “unlearn” the hegemony of ‘objective forecasting’ and thereby for futures research to develop greater diversity (and critical reflexivity) as a whole.
2. Normative forecasting is valuable for its heuristic capabilities. A lens of normativity is necessary for problem-solving with desirable outcomes, addressing concerns such as, ‘what kind of future do we want?’ and ‘how do we create this?’ ‘Objective’, quantitative forecasting models cannot replace this. A normative lens furthermore provides for imagination of alternative, more desirable futures, as discussed above, and enables sensitised consideration of the pragmatic facets of change-making such as the interconnectivities between decision making and social life, how and why change occurs in society (and how it can be instigated), and the fact that various normative outlooks co-occur in societies (Dreborg, 1996).

My backcasting approach

My research followed a similar approach Neuvonen, et al., (2014), albeit being undertaken by only one researcher, with fewer resources, and with a more generalised aim (i.e. Western cities

with large per capita ecological footprints). In addition to situating myself amongst Popper's foresight diamond, my research took two of the four backcasting approaches described by Köves at al., (2013), focusing on:

- Exploring '**pathways**' (i.e. constructing normative visions) along which change could take place; and
- Identifying specific '**actions**' that could contribute to this.

Due to my research focus and resource limitations, I downplayed two alternative foci:

- Achieving specific '**goals**' (e.g. atmospheric carbon thresholds by a specific date; Hawken & Steyer, 2017); and
- 'Participant'-orientated approaches (e.g. creative workshops; Ilstedt & Wangel, 2014).

A key difference between my approach and previous backcasting research was the theory applied. For example, Neuvonen et al., (2014) employed Geels' (2002) framework for technological change, which focuses on the spread of niche technologies through innovation and market forces into broader paradigms; while I applied ecological habitus, focusing more on ecological and social factors (e.g. individual, psychological, and biophysical). It is argued elsewhere that technological/scientific data has been the primary focus of mainstream sustainability knowledge, at the expense of social research and solutions (e.g. behavioural, economic; Goodman, 2010; Williams, 2010), and while Geels' framework includes some social mechanisms, technology remains the focus. The ecological habitus theory that I applied has different strengths, including conceptualising social, psychological, practical, ecological, institutional and other dynamics, as outlined in Chapters 6-7 and discussed throughout Part II of the thesis. Ecological habitus and backcasting have not been combined before (based on my reviews of both topics), and while it is beyond the scope of this research to discuss the differences between Geels' theory and habitus, or to comment on the benefits that ecological habitus may bring to backcasting in general, these offer interesting scope for future research. My research is similar to Neuvonen et al., in that it focuses on envisioning options for creating preferable, sustainable futures, including the development of different tools that could potentially prove 'emancipatory' for enhancing sustainable everyday practice within a range of different actors (e.g. city authorities, including researchers and government, and city dwellers in general, see Chapters 7-10). Finally, as Neuvonen et al., exemplify, backcasting can involve a variety of different methods for data generation. Of these, I adopted an adaptation of the Delphi method for generating collective expert insight.

DISSENSUS DELPHI

In my research I employed a 'dissensus Delphi' approach (Steinert, 2009), which entails the collection of expert-insight and foresight that can be applied to stimulate, discover, and organise

ideas, with the end goal of generating a range of problem-solving solutions that can inspire discussion or support decision-making (Varho & Huutoniemi, 2014). Delphi approaches are commonly employed within sustainability backcasting research (Dreborg, 1996; Quist, 2007), as exemplified elsewhere (e.g. Höjer, 1998; Neuvonen, et al., 2014), and are an established approach within environmental management (Barrow, 2006). The original “Delphi method” was first developed by the RAND corporation, an American non-profit think-tank for global policy, in the 1960s (Dalkey, 1967; Helmer, 1967), and employed to find the “best” solution or “most probable” future outcome in a problem scenario (Varho & Huutoniemi, 2014, p.153), drawing on a panel of experts’ specialised knowledge of existing “facts” (Varho & Huutoniemi, 2014, p.147). Such Delphi approaches have a range of applications including foreseeing and planning for long-term developments in science, technology, demographics, land use, health care, etc. Traditionally, each different ‘problem field’ would compose their Delphi panel to include a diversity of relevant experts (e.g. transport foresight might engage planners, engineers, economists, and technicians specialising in GIS; see Adler & Ziglio, 1996 for further review). The ‘dissensus Delphi’ approach that I employed was more exploratory (Steinert, 2009) but harnessed the same experience-based collective expert vision to foresee alternative futures and to systematise and supplement existing knowledge. Compared to the traditional Delphi, my approach prioritises creative generation of pragmatic, alternative *options* (thus ‘dissensus’) rather than seeking expert consensus on the “best” or most likely option, further embracing the normative ‘visioning’ aspects of the approach (i.e. imagining a *preferable* future requires more normative imagination than a *probable* future) (Varho & Huutoniemi, 2014, p.153).

Responding to critiques of Delphi approaches

The major strength of Delphi approaches is the systematic distillation of a “vast mass of information” that can be applied to improving judgement and decision making (Adler & Ziglio, 1996, p.6); generating desirable and interesting images of the future; and highlighting strategic options for creating change towards these (Dreborg, 1996). Hence its suitability in backcasting research. Its limitations and theoretical assumptions are also similar to backcasting. Compared to quantitative and/or deductive forecasting approaches, the Delphi method cannot provide the standard tests and confirmations of experiments (Adler & Ziglio, 1996). However, both are speculative by definition when contemplating the future (Dalkey, 1967; Dalkey, 1968) and limited by available data (in the case of Delphi approaches, this is the quality of the expert panel; Linstone & Turoff, 1975).

Selection of well-informed, articulate experts with specific relevance to the research aim is therefore important (how I did this is covered in Chapter 4, section 4.2.3). Diversity in the expert panel is seen as especially significant to the Delphi’s underpinning assumption that “several heads are better than one”, in the same way as for trustee boards, committees, juries, and democracy in

general (Dalkey, 1968, p.6). A plurality of perspectives (e.g. disciplinary, institutional) can provide a diversity of reasoning and heuristic capabilities (and associated theories, methodologies, approaches, and experiences) that can be applied to generate a diversity of problem framings and variety of potential solutions, and potentially counter-skew for particularly unreflexive mind-sets or biases that experts hold, providing for more balanced (but not objective) outcomes (Varho & Huutoniemi, 2014).

Collective expert insight methodologies in general draw on “wider and deeper knowledge than laypeople’s views” (Varho & Huutoniemi, 2014, p.148) and the Delphi approach has the added benefit (e.g. compared to expert panels, workshops etc., see Popper’s diamond, above), of keeping the experts separated, which is evidenced to lessen the influence of dominant individuals, group pressure for conformity, and other social dynamics that can skew responses in a group situation (Dalkey, 1968). This further enables a natural diversity of opinions to emerge (Bell, 2004).

The Delphi approach can also inform forecasts when data is lacking or conventional methods fail. Experts, as “observers of information” (Varho & Huutoniemi, 2014, p.145), can provide both “evidence-based and rational” perspectives and offer “best estimates of an uncertain issue, including future events” (Varho & Huutoniemi, 2014, p.144). In the Delphi literature the combination of ‘factual evidence’ and tacit information (not necessarily confirmed yet as certain) that experts hold is seen as a “grey area” of knowledge, that can be thought of as ‘wisdom’, ‘insight’, ‘informed judgement’, or ‘experience’ (Dalkey, 1968, p.4). Such emergent and collective knowledge is especially valuable to research focused on ‘wicked’ problems such as sustainability, where “factual knowledge” alone has thus far failed to provide solutions (Varho & Huutoniemi, 2014, p.148). In the same way as backcasting it can also inform research into problems with no straightforward solution or a long time horizon (e.g. sustainability) or those where the scope/number of factors involved are indeterminate (Varho & Huutoniemi, 2014, p.145).

Delphi approaches are also subjective, and influenced to degrees (like all research) by social structure, personality, faith, logic, and observation (Linstone & Turoff, 1975). Like backcasting, Delphi has been criticised for the ‘oracular’ connotation associated with it – in this case reinforced by its name (Dalkey, 1968) and the normativity of the process involved (Varho & Huutoniemi, 2014). Retorts to this critique are two-fold. Firstly, ‘oracular’ connotations are misguided; the intention of the method is heuristic, seeking to “make... the best” of imperfect “fund[s] of information” (Dalkey, 1968, p.8), rather than to accurately predict the future. Secondly, Delphi is indeed normative, again by intention. Experts are selected for Delphi approaches precisely because they are not ‘neutral’, but have informed opinions and particular viewpoints of relevance and value to the research (Varho & Huutoniemi, 2014).

Like backcasting research, this normative element is a strength of the Delphi approach. A “central characteristic of cognitive expertise is the ability to make immediate, unreflective situational responses (Varho & Huutoniemi, 2014, p.145). Experts are positioned to “manage information quickly” in this way, using their “gut-feeling” and “intuition”, gained through cumulative past experiences, to make decisions without long winded deliberation (Varho & Huutoniemi, 2014, p.145). Such “heuristics” enable them to “deal with uncertainty and make connections between various drivers” when problem-solving (Varho & Huutoniemi, 2014, p.145). In other words, it is experts’ complete habitus that make them valuable informants of future forecasts, and both backcasting and Delphi methods recognise and embrace this to construct potential solutions.

Delphi methods and my approach

The traditional Delphi has a fixed protocol, seeking to solve a defined problem through structured, and anonymous deliberation by the experts (Linstone & Turoff, 1975), using paper or computer-based surveys (these aid access to spatially dispersed and busy experts; Adler & Ziglio, 1996). Stage one is exploratory gathering of ideas from the different experts’ perspectives, which the researcher then summarises to create a selection of potential solutions (Adler & Ziglio, 1996). Traditionally, further rounds of controlled feedback and deliberation ensue (i.e. with results from one round fed back to the experts repeatedly) until a consensus is reached by convergence of opinion (Adler & Ziglio, 1996; Dalkey, 1968) or statistical aggregation (i.e. averaging of panellists’ survey responses; Dalkey, 1968); or a series of expert-ranked solutions is produced (Adler & Ziglio, 1996). However, modern ‘dissensus Delphi’ approaches are more diverse than traditional protocols (like contemporary backcasting, as discussed above), and can include, for example, visioning through desktop reviews by single researchers, pooling of ideas through interdisciplinary teams and panels, workshops, or interviews (Varho & Huutoniemi, 2014). The data generation instrument that I used to execute my backcasting, dissensus Delphi methodology was qualitative, expert interviews. These were correspondingly future-orientated, exploratory, and normative. The methodology of expert interviews and their pros and cons with reference to my research aim are discussed in Chapter 3.

APPENDIX 3

GROWING CRITICAL REFLEXIVITY: REFLECTIONS ON MY RESEARCH METHODOLOGY

This appendix briefly outlines some of the ways that reflexivity and other elements of Bourdieuan theory, which underpins this thesis, informed my personal research methodology and process. In particular, this research involved my own application of critical ecological reflexivity (critER), which includes elements of critical sociological reflexivity. The literature and theory of ecological reflexivity are discussed in detail in Chapter 7.

My research was developed, conducted, and is reported on here through the lens of my own (ecological) habitus (see Appendix 1), as well being influenced by the experts and my supervisors, among others. The same research process undertaken by another individual, in even a slightly different context, would have yielded different outcomes and perspectives. Similarly, if I began again today, the research would inevitably take a different route and result in different outcomes. This is a definitive element of this thesis and my research, perhaps in comparison to many of my peers in the school of science. It demonstrates the inherently subjective nature of qualitative interviewing and analysis. Nevertheless, assessment of the robustness of my method and consequent results is enabled here through my comprehensive description of my research practice and endeavour to critically reflect upon the instrumental factors of its construction.

With regards to my methodology, I focus on the role of conscious reflexivity (i.e. conscious and critical reflection upon ecological habitus and associated factors as concepts, descriptors, and tools; and the potential for their revision). This reflexivity was both imposed upon me periodically as my research presented conceptual challenges, and intentionally applied by me (with intentional and unintentional prompting from supervisors) and helped me to develop nuances in my understandings and critically challenge my existing assumptions (and those of my supervisors). I undertook such conscious refinements (undoubtedly alongside unconscious forms of change) throughout the research process. In the normal way of habitus, this of course influenced my supervisors reciprocally, and for at least one this was a conscious enrichment process.

A major part of my own reflexive development was moving away from the quantitative research methodologies that were familiar and comfortable to me from my previous tertiary education in ecology as a science (and as opposed to social-science focused fields). There were three particular factors that highlighted this to me, heightening the degree of my reflexivity. The most significant factor was my burgeoning grasp on Bourdieu's habitus, a second factor was my field research in a foreign country, and a third was the critical interview discourse of experts from different disciplines than my own.

My initial introduction to the sociological literature, and particularly that of Bourdieu, required me to stretch my existing science-based habitus to apply what cultural (intellectual) capital I already held to this unfamiliar academic and epistemological field. As I progressed in my understandings of this theory and began to assimilate it into my research, "thinking in terms of habitus" became part of my habitus, a common phenomenon/grace/affliction among Bourdieuan scholars (Maton, 2008, p.64). This provided me with a very different, more sociological lens through which to view things, and when overlaid consciously onto various day-to-day scenarios and pre-existing tacit patterns of thought, served to reframe that which I already 'knew'. To some extent, my background in ecological science facilitated the implementation of this. Ecology relies on the contemplation of context and the interrelations between things in a way that parallels the social and biographical contexts that are inherent in Bourdieu's notion of habitus. This enabled some natural consideration of the socio-ecological relations that my research question required.

This effect was exacerbated through my interactions with my various supervisors. As each of them stemmed from different disciplinary backgrounds (these spanned anthropology, sociology, economics, resource management, and earth science), they brought their own distinct habitus and various understandings to our discussions. Integrating the different perspectives that they projected, and bridging our divergent understandings was one of the greatest reflexive challenges of my research and expanded my world-view and the scope of my research lens greatly. As I later found, working across disciplines in this way proves too difficult for many people in academia, professional practice, and city governance (see Chapter 8). In this instance, the ecological habitus framework that I developed throughout my thesis was what provided me with a way to situate and understand some of these discrepancies, although the framework itself was not fully formed during much of this process.

A second way that my reflexivity grew was through my field research in North America. This was my first foray abroad, and accordingly, presented both a novel experience and a foreign field within which to practice and develop my existing habitus. In this case, my reflexivity was heightened by my sudden and complete immersion within an exotic (yet in many ways familiar) society, resulting in constant conscious and unconscious comparison of the various aspects of my day-to-day life in North America, to those of my native fields in New Zealand. These experiences reframed and thereby further delineated to me what constituted my habitus to begin with, as well as leading, inevitably, to a degree of change.

One of the ways that this manifested was through the photographic notes I took as I travelled. Sweetman (2009) outlines the power of photography in portraying, non-verbally, the infinitesimal and mundane aspects of habitus day-to-day. Photography also offers a means by which to articulate the dissonance of an unfamiliar field, which unbeknownst to me at the time was something practiced by Bourdieu himself (Bourdieu, 1965). I captured endless photos of fire hydrants for example, simply because of their unfamiliarity and ubiquity. I conversely amassed photos of people walking their dogs, which upon critical reflection represented accordance with the familiar. In this way, many of the images that I chose to capture during my field research (totalling more than 17,000) portrayed elements of comparison between this alternative social and material environment and that of my home, a comparison that ubiquitously heightens critical and reflexive development of self (Adler, 1975). Thus, this process contributed to the development of my own critER and informed my conscious understanding and ability to critically conceptualise this phenomena.

The third way that my reflexive practice was enhanced was through the interview process and analysis. As well as the heightened reflexivity and self-consciousness created by interviewing experts, and the interview situation itself, the diverging disciplinary terminologies, understandings, perspectives, and foci portrayed by the experts provided reflexive contrast to my own. Practicing reflexivity in the interviews (i.e. trying to understand the experts' perspectives by recognising the occurrence of my own habitus lens) enabled me to engage more easily with the different understandings of the experts, facilitating my comprehension of their meanings and the contexts of their responses (Edwards & Holland, 2013; Mishler, 1986). My ability to assume reflexivity in this interdisciplinary context was facilitated by the diversity of my previous studies across natural sciences, fine arts, and Māori culture, and some mindful-observation practice. It also undoubtedly reflects the habituated middle-class conscious self-reflexivity of modern life that is routinely generated by tertiary liberal education, and meaning-centric occupations and lifestyle consumption (Sweetman, 2003).

Finally, some of the experts critically examined the wording, inherent meanings, and purposes of my questions and associated understandings, and this served to amplify my critical self-reflection (discussed further below). I doubt that I would have been able to assume this level of reflexivity at the outset of my research, but became increasingly curious and capable of critically deconstructing elements of my own habitus and understandings, particularly when experts conveyed the relative inadequacies of my conceptualisations. I include two quotes from the interviews here in line with my self-reflexive, iteratively developed methodological approach. These are to provide the reader with an example of how parts of the analysis process informed my ongoing development as a researcher. These examples are not intended to be considered as results.

When you mean sustainable, you mean cities that take care of themselves? Is that what you mean? I think you have to take time to question sustainability. Since cities have been made, I don't know of any that are sustainable without people.

I'm sorry I'm kind of resisting your questions because I feel like there are all kinds of assumptions built in to the questions themselves, like we've got to figure out 'what's the most pressing issue' and 'what's the best scale'. ... I really feel strongly – as you might have guessed - about unpacking assumptions embedded in our thinking about these things.

My questions in the interviews were open-ended and were intended to garner a response from the experts, but more importantly to be a starting point from which the experts might discuss facets of their own research, experiences, and interests. In the interviews quoted above, the wording of some questions led to a critique of terms and assumptions. This stymied the initiation of open discussion to some degree, and I found it hard to conceive of alternative starting points where mutual understanding might be found, and from where discussion might be allowed to develop. At the time I found this frustrating, which I think is a reflection of my relative inexperience with critical interdisciplinary discussions, where time had not previously been made to establish common ground. Upon later reflection, I recognised this experience as also being exemplary of the divergent disciplinary nomenclatures that can act as a barrier to mutual interdisciplinary understanding and collaboration (see Chapter 8). One way that I could have become more prepared for this would have been to conduct more pilot interviews with a greater diversity of people (e.g. different experts from within New Zealand), and in particular with critically reflexive individuals who might have raised similar contestations.

Together these three components of the research deconstructed, supplemented, and advanced aspects of my thinking, elevating reflexivity of my own habitus, and thereby revealing various subjective understandings and biases that are reflected in the aim, outcomes, and foci of this thesis. In Bourdieu's work, the purpose of reflexivity was to promote the recognition of a researcher's conceptual and practical biases, to eliminate (or more realistically, reduce) their effects from the research (Bourdieu, 1990). In contrast, I aim to report on these transparently as integral elements of my research, aligning with modern qualitative literature that recognises interviewing as a craft learned through practice (Brinkmann & Kvale, 2015), where researchers are emotionally engaged (Edwards & Holland, 2013) and actively participate in the dynamics of the co-construction of knowledge. This is discussed further in the three method and methodology chapters of the thesis.

APPENDIX 4

PROPOSED FIELD RESEARCH ITINERARY SHOWING SHORTLIST OF 32 EXPERTS

This appendix presents the shortlist of 32 experts initially invited to participate in this research. Of these, 20 were interviewed. Profiles of experts who could not be interviewed are shaded grey. The five experts selected through snowball sampling are not listed here; however, details of their roles at the time of their interview can be found in Table 4 (section 4.2.3).

Proposed interview date	Location	Role of expert at time of invitation (details and U.S. spelling as per online profiles, circa ~2012)
August 2012 Ohio		
Columbus Ohio 3 Aug (Fri) 5 Aug (Sun)		Attend 2012 Behavior Change for a Sustainable World Conference
Wooster Ohio 7 Aug (Tue) 8 Aug (Wed)		Susan Clayton Professor of Psychology and Environmental Studies - The College of Wooster. Environmental identity, conservation psychology, environmental education and socialization, environmental attitudes, and environmental conflict.
Cleveland Ohio 9 Aug (Thu) 10 Aug (Fri)		David Beach Director GreenCityBlueLake; writer, editor, and community activist. Urban design, land use, transportation planning issues.
Santa Fe New Mexico 13 Aug (Mon)		David Abram Cultural ecologist, philosopher, and performance artist; founder and creative director of the Alliance for Wild Ethics. "It is not by being abstract intellectuals that we are going to fall in love again with the rest of nature. It's by beginning to honor and value our direct sensory experience..."
Aug – Sept 2012 West Coast USA		
San Diego California 15 Aug (Wed) 16 Aug (Thu)		P. Wesley Schultz Professor of Psychology - California State University, San Marcos. Applied social psychology, sustainable behaviour.
San Diego California 17 Aug (Fri) 20 Aug (Mon)		Richard Louv Journalist, author; founding chairman of the Children & Nature Network. Connections between family, nature, and community.
Oakland California 22 Aug (Wed) 23 Aug (Thu)		Richard Register Artist, writer; president of Ecocity Builders. Ecological city design and planning.

Berkeley California 24 Aug (Fri) 27 Aug (Mon)	 Walter J. Hood Professor of Landscape Architecture & Environmental Planning & Urban Design - Berkeley; Founder of Hood Design. Landscape design, community development, citizen participation, design of architecture and landscape simultaneously.
Portland Oregon 29 Aug (Wed) 30 Aug (Thu)	 Robert Costanza Professor of Sustainability - Institute for Sustainable Solutions, Portland State University. Transdisciplinary integration, systems ecology, ecological economics, landscape ecology, ecological modelling and design, energy analysis, environmental policy, social traps, incentive structures and institutions.
Seattle Washington 4 Sept (Tue) 5 Sept (Wed)	 Alex Steffen Planetary Thinking; writer, public speaker and strategic consultant; Executive Editor of Worldchanging 2003 - 2010. "We find ourselves facing two futures, one unthinkable and the other currently unimaginable, My beat is looking for ways to create a future which is sustainable, dynamic, prosperous and fair - a future which is both bright and green."
Seattle Washington 6 Sept (Thu) 7 Sept (Fri)	 Peter H. Kahn, Jr. Associate Professor - Department of Psychology; Director of the Human Interaction With Nature and Technological Systems Lab - Department of Psychology, University of Washington. The nature language project - we love nature, fear it, play in it – but we're losing it, and we're losing the language to speak of it.
Sept – Oct 2012 Canada	
Edmonton Alberta 12 Sept (Wed) 13 Sept (Thu)	 Randolph Haluza-DeLay Associate Professor of Sociology -The King's University College, Alberta Canada. Environmental sociology, environmentalism, environmental justice, social movements, community development, and non-profit organizations.
Calgary Alberta 14 Sept (Fri) 17 Sept (Mon)	 Beverly Sandalack Professor of Environmental Design Practice, Sustainable Design, Urban and Regional Planning, and Design - Faculty of Environmental Design, University of Calgary. Sustainable urban and innovative neighbourhood design, small town planning and design, landscape, open space and environmental planning, sense of place, local and regional identity.
Athabasca Alberta 18 Sept (Tue) 19 Sept (Wed)	 Bruce Morito Associate Professor of Philosophy - Centre for Global and Social Analysis, Athabasca University; editor of The Trumpeter. Environmental philosophy, environmental ethics, value theory, aboriginal rights, metaphysics, personal identity, and philosophical psychology.
Toronto Ontario 24 Sept (Mon) 25 Sept (Tue) AM	 Ingrid Stefanovic Professor of Philosophy – University of Toronto; Senior Scholar - Center for Humans and Nature, Chicago. Environmental philosophy, environmental and architectural phenomenology, values, and assumptions affecting environmental decision-making and public policy.

Toronto Ontario 25 Sept (Tue) PM 26 Sept (Wed) AM		Nina-Marie Lister Associate Professor of Urban and Regional Planning - Ryerson University, Toronto; founding principal of Plandform. Adaptive ecological design for ecosystem complexity and biodiversity conservation, parklands and waterfronts in post-industrial landscapes.
Ottawa Ontario 27 Sept (Thu) 28 Sept (Fri) AM		Greg Searle Executive Director BioRegional North America; international consultant, facilitator, and entrepreneur, expert on sustainable lifestyles. Sustainability Action Plans and Green Lifestyle programs.
Québec City Québec 1 Oct (Mon) 2 Oct (Tue)		Carole Després Professor of Architecture and Urban Design - Laval University; Co-founder of the Interdisciplinary Research Group on Suburbs. Residential environments and behaviours, including fundamental research, action-research, and design; bridging the gap between knowledge and practice.
October 2012 North East Coast USA		
Boston Massachusetts 11 Oct (Thu) 12 Oct (Fri)		Mitchell Thomashow Director of the Second Nature Presidential Fellows Program; teacher, writer, and executive consultant. Ecological awareness, sustainable living, creative learning, improvisational thinking, social networking, and organizational excellence.
Boston Massachusetts 15 Oct (Mon) 16 Oct (Tue)		Juliet Schor Professor of Sociology - Boston College; Senior Scholar at the Center for Humans and Nature (Practicing Plenitude project); co-founder Center for a New American Dream. Consumer society and culture, working hours and lifestyles, environmental degradation, sustainable consumption and production, and alternative, sustainable economies and societies.
New Haven Connecticut 18 Oct (Thu) 19 Oct (Fri)		Stephen R. Kellert Tweedy Ordway Professor Emeritus of Social Ecology and Senior Research Scholar - Yale University School of Forestry and Environmental Studies. Interdisciplinary research, the connection between nature and humanity, environmental conservation and sustainable design and development, 'biophilia' - nature in the built environment, 'biophilic design.'
Piermont New York 22 Oct (Mon) 23 Oct (Tue)		Janice E. Perlman Founder and President, The Megacities Project; Founding Board Member of the International Council of Local Environmental Initiatives Hastening time between ideas and implementation in urban problem-solving by sharing approaches among innovative leaders in the world's largest cities. Problem-solving and policy-oriented research for neighbourhood, city, county, and regional solutions.
New York City New York 25 Oct (Thu) 26 Oct (Fri)		Fred Kent Founder and president - Project for Public Spaces. Revitalizing city spaces, liveability, smart growth and the future of the city.
New York City New York 29 Oct (Mon) 30 Oct (Tue)		Kathy Madden Senior Vice President – Project for Public Spaces; environmental designer. Placemaking as it relates to urban design and liveability; leading authority on parks, plazas, and open spaces.

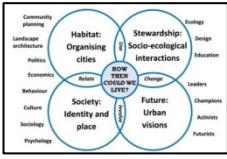
South Bronx New York 31 Oct (Wed) 1 Nov (Thu)	 Majora Carter Founder - Sustainable South Bronx and Majora Carter Group, Bright Green Bronx—and Beyond. Training people who need work to shepherd in new green technologies, transforming polluted sites into lush community spaces, and generally ensuring that everyone has a stake in the clean energy economy.
Nov – Dec 2012 South East Coast USA	
Philadelphia Pennsylvania 5 Nov (Mon) 6 Nov (Tue)	 Margie Ruddick Consultant at Margie Ruddick Landscape, teacher, lecturer, and writer. Work that integrates great landscape design with ecology.
Philadelphia Pennsylvania 7 Nov (Wed) 8 Nov (Thu)	 James Corner Professor of Landscape Architecture - University of Pennsylvania School of Design; Principal of James Corner Field Operations. Landscape architecture, urban design.
Washington DC 12 Nov (Mon) 13 Nov (Tue)	 Barbara Deutsch Executive Director - the Landscape Architecture Foundation. Re-greening cities, research and program development, community outreach, and education.
Arlington Virginia 14 Nov (Wed) 15 Nov (Thu)	 Bill Drayton Social entrepreneur, Ashoka CEO and founder. “What is the most powerful force in the world? A big pattern-change idea.”
Charlottesville Virginia 19 Nov (Mon) 20 Nov (Tue)	 Timothy Beatley Teresa Heinz Professor of Sustainable Communities - Department of Urban and Environmental Planning, School of Architecture, University of Virginia. Sustainable communities, creative strategies by which cities and towns can fundamentally reduce their ecological footprints, become more liveable and equitable places.
Sweet Briar Virginia 26 Nov (Mon) 27 Nov (Tue)	 Debbie Kasper Assistant Professor - Department of Sociology, Sweet Briar College. Environmental sociology, social theory, community, stratification, sociology of religion, American culture, urban sociology, socio-ecological problems and solutions, sustainable communities.
Atlanta Georgia 29 Nov (Thu) 30 Nov (Fri)	 Ellen Dunham-Jones Professor of Architecture and Urban Design - The School of Architecture, Georgia Tech. Sustainable urban design, suburban redevelopment – (re-inhabitation, re-greening, and redevelopment of big box stores, office parks, etc.), new urbanism & smart growth, health and urban design, post-industrial development patterns and globalization, contemporary architectural theory.
Venus Florida 3 Dec (Mon) 4 Dec (Tue)	 Jacque Fresco Futurist, social and structural engineer, architectural and industrial designer, author, lecturer, philosopher of science, concept artist; founder and director of The Venus Project. Holistic design of sustainable cities, energy efficiency, natural resource management, cybernated technology, advanced automation, and the role of science in society.

APPENDIX 5

INTERVIEW GUIDE TEMPLATE

This interview guide shows the finalised set of questions that I asked in the interviews. All main questions were asked in each interview, while additional questions/prompts were used when a participant's response was short/closed, or if the course of the interview strayed from the main questions/objectives.

This guide is not printed to scale. In the interview, printed copies had narrower margins and more space for notes than is shown here. However, this space proved to be insufficient for all of the notes I took in each interview, and notes often went into the margins and over the page. This worked sufficiently; therefore, I did not expand the interview guide onto additional pages. This saved me from carrying the extra weight of additional paper as I travelled for over four months.

Main questions	Link to interview objectives	Additional questions/prompts	Time	Notes
1. Which bubble/domain do you identify yourself/your work with?		 Presented diagram here.		
2. How did you come to be in your current line of work/research?	Why is this important?	How much crossover is there between your research and your everyday life or the life of people in your city?		
3. What was influential to you in developing a relationship with or interest in the natural environment (to begin with)?	Why is this important?	Who inspired these ideas? At what point in your life did this occur?		
4. How is your work similar to or different from the work of other people who have the goal of creating cities that promote ecological sensitivity in society?	Where are we going?	What is your group/company's group ethic on these issues? How does your approach differ from other people's?		
5. To what degree do you think there is collaboration across the disciplines involved in these issues?	How do we achieve it?	How do you envisage a better way of collaborating across disciplines? For the FUTURE What kind of interaction does your organisation have with other disciplines/ the local community?		
6. What are the most pressing enviro issues that need addressing in your <u>geographical</u> area/ in your discipline?	What are the current problems?	Are physical changes enough? How is this specific to cities? How important is it to have a holistic approach when addressing the issues / finding solutions?	35 – 40 min	Continues over page

7. At what level is the drive for change and initiation of these ideas required to be successful?	How do we achieve it?	Top-down vs. bottom-up? Government/institution/ community/neighbourhood level? Role of education/awareness of current projects/initiatives? Is it possible to create a widespread mind shift/sea change in prevailing ideas /legislation?		
8. What do you think provides the best opportunity for meaningful powerful incorporation of nature into cities and the everyday lives of city people?	What do we need to do? How do we achieve it?	Are psychical changes within urban areas enough? What about people's perceptions and expectations? What would be required to create a permanent positive change?		
9. What do you perceive is the main barrier to implementing these ideas (recap their ideas thus far if clarification needed). 10. How might these barriers be overcome? Do you think it is possible?	How do we achieve it?	Link to issues from question 6. Link to role of government institutions – economic aspects, from question 7. Where have opportunities for change arisen in your experience? What are some examples of efficient ways to make significant changes? What is required for these changes to be on-going/self-reinforcing/sustainable in the long-term?		
Is there anyone <u>else you think I should contact</u> or <u>extra resources you would recommend</u>? From <u>your experience</u>, is there <u>anything I should have asked</u> you that I have not?			THANKS for making time to see me	

APPENDIX 6

INFORMATION SHEET

INFORMATION SHEET

Society, stewardship and habitat: how then could we live?

Researcher Introduction: Alice Taylor

I am a PhD candidate studying Environmental Management at Massey University in New Zealand.

Research Aim

The primary aim of my research is to investigate ways of designing and planning cities to promote a future of positive *ecological habitus* in New Zealand.

Research approach

Following a literature review I have identified 32 thinkers whom I believe are contributing to the way we should think about urban nature, particularly how to organise urban areas for community inclusion and connectivity with nature; how to make a space work ecologically and for the inclusion and benefit of people; why people maintain certain values, attitudes and interactions with their “place” at an individual and community level; and identifying the innovators, initiators, and visionaries that are generating new visions for cities of the future.

The individuals identified have developed ideas that may yield the answers to many of the questions being asked by New Zealanders about how we could live in the future.

USA/Canada fieldtrip

The initial part of this research will entail interviews with globally acknowledged experts. The research is interdisciplinary and includes four broad groups of disciplines that together will provide a basis for addressing the research aim. These are:

1. *Habitat*: organising cities (landscape architecture, community planning and related disciplines)
2. *Stewardship*: socio-ecological interactions (ecological design, conservation, education and related disciplines)
3. *Society*: identity and place (sociology, psychology and related disciplines)
4. *Future*: urban visions (leaders, champions, activists and futurists)

Invitation to Participate

My literature review identified you as one of the 32 experts in the USA or Canada whom I would like to interview. You have been selected because I believe that your worldview would contribute to my research, offering insights into how we could live in the New Zealand of the future.

The interview

Each interview will be about an hour long and will focus on forward thinking approaches, examining ideas, experiences, and philosophies in order to gauge the collective thinking across a diversity of disciplines. These interviews will inform the development of an aggregated holistic model that will be tested in New Zealand to determine how receptive society is to alternatives of how we *could* live in the future.

Data Management

Interviews will be audio recorded and the transcribed interviews will be analysed to inform my research. Recorded interviews will be stored securely in a digital form by the researcher, and will be available only to the researcher and supervisors. As well as providing data for my thesis, my research may be included in presentations, journal articles and other publications in the future. Participants will be identified in their expert capacity within the research, and a summary of the interview recording will be available to participants on request.

Participant Rights

You are under no obligation to accept this invitation. If you decide to participate, you have the right to:

- decline to answer any particular question;
- withdraw from the study at any time;
- ask any questions about the study at any time during participation;
- be given access to a summary of the project findings when it is concluded; and
- ask for the recorder to be turned off at any time during the interview.

Project Contacts

If you have any questions or would like to receive further information about the project, please contact:

Researcher

Alice Taylor - PhD Candidate
Institute of Natural Resources
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Supervisors

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+64 6 [redacted]

Ethics Statement

The University requires that ethics approval be obtained for research involving human participants. This project has been evaluated by peer review and judged to be low risk. Consequently, it has not been reviewed by one of the University's Human Ethics Committees. The researcher named above is responsible for the ethical conduct of this research.

If you have any concerns about the conduct of this research that you wish to raise with someone other than the researcher, please contact Professor John O'Neill, Director, Research Ethics, telephone 06 [redacted], email [redacted]@massey.ac.nz.

APPENDIX 7

PARTICIPANT CONSENT FORM



Institute of Natural Resources
PALMERSTON NORTH
New Zealand
<http://envmgt.massey.ac.nz>
[redacted]@uni.massey.ac.nz

PARTICIPANT CONSENT FORM – INDIVIDUAL

Society, stewardship and habitat: how then could we live?

I have read the Information Sheet and have had the details of the study explained to me. My questions have been answered to my satisfaction, and I understand that I may ask further questions at any time.

I agree to participate in this study under the conditions set out in the Information Sheet.

I agree to the interview being sound recorded.

I understand that I will be identified in my expert capacity within this research.

Signature:

.....

Date:

.....

Full Name - printed

.....

APPENDIX 8

LIST OF EXEMPLAR QUESTIONS FOR EXPERTS' REFERENCE BEFORE THE INTERVIEW



Institute of Natural Resources
PALMERSTON NORTH
New Zealand
<http://envmgt.massey.ac.nz>
_____@uni.massey.ac.nz

Dear Participant,

The following is a list of some of the questions you may be asked during the interview:

1. How did you come to be in your current line of research?
2. What was influential to you in developing a relationship with, or interest in the natural environment?
3. How is your work similar to, or different from, the work of other people who have the goal of creating cities that promote ecological sensitivity in society?
4. To what degree do you think there is collaboration across the disciplines involved in these issues?
5. What are the most pressing environmental issues that need addressing in your urban area or the area you study?
6. What do you think provides the best opportunity for meaningful, powerful and systematic incorporation of nature into cities and the everyday lives of city people?
7. At what level of society is the drive for change and initiation of these ideas required to be successful?
8. What do you perceive is the main barrier to implementing these ideas?

APPENDIX 9

EMAIL INTERVIEW:

INSTRUCTIONS, ATTACHMENT, AND QUESTIONS

Verbatim emailed instructions (formatting condensed for thesis):

THE INTERVIEW

This is a list of 12 sets of guide questions. These questions are meant as a starting point only, to direct the interview, and I encourage you to elaborate throughout, and to include any extra information that you consider pertinent alongside answering the questions themselves. Please write your answer after each question, retaining the questions in your response email.

Please fill in the interview and return, preferably before June the 5th, 2013. In order for the interview process to be comparable with the face-to-face interviews, I will email you with some short follow up questions once I have received your response.

Thank you, Alice Taylor

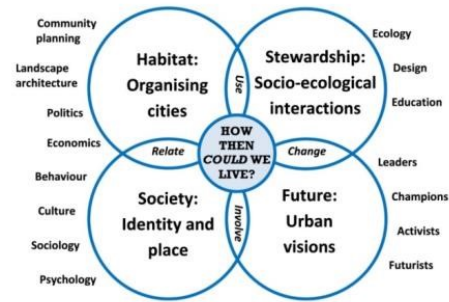


Diagram of conceptual map that was attached to email interview

SOCIETY, STEWARDSHIP AND HABITAT: HOW THEN COULD WE LIVE?

Question 1: Please download the attached diagram. The diagram depicts the range of disciplines that I am looking at through my research. Each large blue circle represents a domain of knowledge to be examined. Where the circles overlap represents types of interaction with the natural environment. Around the outside of the diagram are some of the disciplines that contribute towards the ultimate question of my thesis, “How then could we live?” Considering the diagram, which of the four blue circles would you consider yourself and your work to fall within? Please select one or more circles that you relate to, and expand on the reasons for your choice.

Question 2: How did you come to be in your current line of work/research? Please comment on the path that brought you here and why you have chosen this occupation.

Question 3: What was influential to you in developing a relationship with, or interest in the natural environment? Please also consider people who may have inspired this within you and at what point in your life this occurred.

Question 4: How is your work similar to, or different from, the work of other people who have the goal of creating cities that promote ecological sensitivity in society? Please outline what is unique about the approach that you take.

Question 5: To what degree do you think there is collaboration across the disciplines involved in these issues? Please consider ways to improve on this, and outline any forms of collaboration that you participate in at present (e.g. collaboration between/across disciplines, with organisations, or with the community).

Question 6: What do you consider are the most pressing environmental issues that need addressing? Please outline the issues in your geographic area and, more broadly, issues that are the focus of your discipline/work.

Question 7: With regards to the issues that you discussed in Question 6, above, at what level or levels does the drive for social change and initiation of ideas have to come from for positive changes to occur and be successful in the long term? Top-down, or bottom-up? E.g. government / institutions / community / neighbourhood / individual. Do you think it is possible to create a widespread mind shift in prevailing ideas?

Question 8: What do you think provides the best opportunity for meaningful powerful incorporation of nature into cities and the everyday lives of city people?

Are physical changes within urban areas enough – or are efforts needed to change people’s perceptions and expectations more directly?

Question 9: What do you perceive as the main barriers to positive change with respect to the issues raised in Question 6?

Question 10: What is required to overcome these barriers?

Question 11: Please make any comments that you would like to include that were not covered in the previous questions.

Question 12: Are there any resources you would recommend me investigating during my research? E.g. articles, people, projects, organisations, websites, books.

Thank you very much for your time!

APPENDIX 10

EXAMPLES OF DATA CODES

This list of codes exemplifies the kinds of specific concepts that different experts raised during the interviews. When experts' own statements were concise, I used *in vivo* codes (i.e. direct quotes); otherwise I condensed interview segments into my own concise statements. The assortment presented here contributed to the 'greening' category of the sticky-note network (Figure 5). Additionally, an overview of experts' responses to all questions is given in Appendix 12 and examples of experts' ideas about change are given in Appendix 13.

Disclaimer: The following are my own working notes, and are presented here only to exemplify this stage of my research process transparently. By definition, codes are fragments, and interpreted summaries of fragments from larger transcripts. In this decontextualised form, the excerpts below cannot be construed as representative of experts' overall opinions, and cannot be interpreted meaningfully without understanding of the broader interview outcomes.

- Inserting natural elements, particularly trees, into cities is a low hanging solution and has multiple co-benefits - Ellen Dunham-Jones (Architecture, Georgia Tech)
- Instead of focusing on our impact on the environment, turn it on its head, what is our environment's impact on us? - Stephen Kellert (Social Ecology, Yale)
- Urban forest can be created from joining up existing areas comprehensively within city plans - Beverly Sandalack (Enviro Design and Urban Planning, Uni of Calgary)
- To connect with nature it can't all be about wilderness, for people (including adults) to connect with nature there has to be nearby nature, there has to be nature in cities - Richard Louv (Author; Children & Nature Network [Founder])
- To be happy, productive, and at ease in the world, we need contact with nature - Tim Beatley (Sustainable Communities, Uni of Virginia)
- The best ways to integrate nature into cities are hands-on. Food is the ultimate solution - our food supplies will be disturbed so we need alternatives - Margie Ruddick (Landscape Architecture Firm [Principal], Pennsylvania)
- A way to give meaning to space is to enable the idea of time. Let people understand the space over time and reflect how things happen in nature, flux - Margie Ruddick
- Cities [designs/operations/organisation/function] should be based on *where* they are - Walter J. Hood (Enviro Design, UC Berkeley)
- Natural elements must reflect the context of the city (when they are in a city) not be faux wilderness - Clark Wilson (Environmental Protection Specialist, EPA, Washington DC)
- Nature can do a lot of things for free - David Beach (GreenCityBlueLake Institute, Cleveland)
- Don't let space go to waste. With street trees, more is more – Mia Lehrer (Landscape Architect Firm [President], Los Angeles)
- Connection to existing natural resources and landscape (views) physically connect cities to what's 'out there' - Barbara Deutsch (Landscape Architecture Foundation [Executive Director], Washington DC)
- A city can't be green without actual green. Sustainability's focus on waste, transport, energy etc., can overlook the literal green & connection with nature - Barbara Deutsch, Stephen Kellert, Tim Beatley
- In futuristic visions in popular media (movies) there is no green, its evil, its sterile and anonymous, its post-apocalyptic - Barbara Deutsch + Richard Louv
- Circular versus throughput infrastructure what comes out of phase one goes into phase two e.g. office off the grid - Janice Perlman (The Mega-Cities Project [Founder & President], New York)
- Explore – rooted in place, understand your place. Live- sustainability. Transform systems and society - David Beach
- A city as small enough chunks that you can relate to it. Understand it, feel connected, have a sense of ownership, feel responsible - Mia Lehrer
- Energy efficiency won't capture people's imagination; we need to relate it to people's lives... Need to spend more time in nature and make more real connections – Richard Louv

APPENDIX 11

EXAMPLE OF EARLY LOOSE ANALYSIS OUTLINE

Chapter	This chapter is about...	Structure will include...	Topics Covered....	Key words
#1 Introduction 15/9	The need for an interdisciplinary approach to promote ecological habitats. Society, Stewardship & habitat: <u>How THEN could we live?</u>	Write this last <i>What to expect 6 & Approach</i>	Where my work fits into literature My niche	Interdisciplinary Ecological habitats Future urban vision Policy economics ecosystems environment Sense of place natu. *systems biophilia
#2 Method 15/10	My research process ★ Chance for extra paper here with expansion/description of	Objective description Repeatable Concise	Literature search Development of strategy Ethics / approach Interviews / analysis	
#3 Theory 15/4	• theory of ecological habitats shapes what you think possible • Importance of interdisciplinary approach / systems thinking • why I am looking at urban areas. <i>Published paper (1) Enviro Philosophy Systems</i>	urban cities → CULTURAL SYSTEMS / APPROACHES → VALUES BELIEFS THINKING	Literature review and some reference to interview results → Division of human/nature Compartmentalisation of institutions - education - govt / policy - economics - research	Interdisciplinary. Ecological habitats Urban Future Systems* Holistic Silos Education Govt / policy
#4 Society 15/5	Societal Structures: How we do things. <i>Published paper (2) Enviro. money policy.</i> <i>Physical / Soc?</i> <i>Climate change Peak oil Energy Waste Climate Transport</i> <i>Silos Specialisation</i>	Explanation of basic links/system	Policy Economics Resources (nat.) Govt. Democracy Technology Education Health Crime	Policy Economics Culture Future Politics/govt. Democracy Systems* Society eco.hab.
#5 Stewardship 15/6	Stewardship Structures: How we think about things. <i>Thought feeling</i> <i>Reconnect</i>	Who/where/how What needs more research? Sub-sections will include - Results/Discussion - conclusions - Recommendations Interviews literature will be included.	Sense of place Community building Inclusion / collaboration Lifestyles Happiness/productivity Values Beliefs/perceptions Ownership Responsibility	Sense of place Community Biophilia Env. psychology Systems* Stewardship Eco.h
#6 Habitat 15/7	Physical structures: How things are. (what our environment is like) <i>City</i> <i>Published paper (4) Urban sustain.</i>	Problems / actions / barriers and solutions discussed will contribute to	Urban nature Ecosystem services Biophilic design Bioregional context Urbanisation/suburbs Spaces Architecture/Planning Food systems Landscapes Transition towns	Ecosystems (semi) Urban greer Biophilic Transition Design Planning Sustainability Landscape Nature System Habitat Eco.hat
#7 How then could we live? 15/8	Synthesis of Chapters 3-6 Need added value Emergent/transcending messages Delve into connections why/how I divided topic <i>Published paper (5) Suburbs Free zones</i>		Essence of project How then could we live? Vision of what we could achieve	Similar to Intro Keywords
#8 References 15 oct	<i>complete thesis</i>			<i>Not so it right work</i>

APPENDIX 12

MATRIX SUMMARISING EXPERTS' RESPONSES TO INTERVIEW QUESTIONS

Disclaimer: This matrix summarises my interpretations of the 25 experts' answers to the interview questions. The responses presented herein are shaped by my own perception of the interview dialogues. Each expert did not necessarily respond to every interview question directly. Thus, I drew some of the responses (depicted below) from other parts of the experts' respective interviews, where I perceived a question to have been answered. Furthermore, these are working notes, and are presented here only to exemplify this stage of my research process transparently. Any errors in this summary are my own. See Table 4 for a list of experts and their roles at the time of interview.

Interview #	1	2
Expert	Susan Clayton	Debbie Kasper
Q1	Which bubble/domain (Figure 3) do you identify yourself or your work with?	Mostly domain 3, some 2, 4.
Q2	How did you come to be in your current line of work/research?	2,3.
Q3	What was influential to you in developing a relationship with or interest in the natural environment to begin with?	Psychology combined with environmental interest.
Q4	How is your work similar to or different from the work of other people who have the goal of creating cities that promote ecological sensitivity in society?	Sociology (understanding people's place in the world) combined with environmental personal interests; eco-villages (as solution-focused examples).
Q5	To what degree do you think there is collaboration across the disciplines involved in these issues?	Time outdoors in early life; "sense" that it was important.
Q6	What are the most pressing environmental issues that need addressing in your geographical urban area and in your discipline?	Childhood awareness; outdoorsy Dad; time in garden.
Q7	At what level is the drive for change and initiation of these ideas required to be successful?	Focus on people's experiences with nature (including socially).
Q8	What do you think provides the best opportunity for meaningful incorporation of nature into cities and the everyday lives of city people?	Linking what is normal in everyday life to the bigger, unseen picture; not being discipline-bound.
Q9	What do you perceive is the main barrier to implementing these ideas?	Some with community; could be more.
Q9a	Is it possible to create a widespread change?	Some with community; need common framework.
Q10	How might these barriers be overcome? Do you think it is possible?	Land use; energy.
		Energy; climate; fracking (locally).
		Both top-down and bottom-up.
		All; Top-down necessary but insufficient.
		Interaction with 'green' in urban spaces.
		Percentage of urban land that is green space.
		People's perceptions of what is normal and relevant to them (economically and politically).
		Finance; laws.
		Yes; the question is can we do it fast enough.
		Yes.
		Understand people's reservations and make it easy; change what is perceived as normal.
		Bring awareness to taken-for-granted everyday things; better dissemination.

	3	4	5	6
	David Beach	Robert Costanza	Richard Louv	Richard Register
Q1	1,4.	1,2,3,4.	1,2,3,4.	1,2,3,4.
Q2	Journalism.	Architecture and systems studies.	Journalism.	Architecture/ ecology; spending time with Paolo Soleri.
Q3	Time with eco-informed local people/groups after college.	Childhood experience of steel mill pollution; university; Herman Daly.	Childhood outdoors; parents; Thomas Berry.	Childhood in the desert, threat of nuclear war, involvement in environmental defence.
Q4	Applied focus; implementation in community (through museum).	Focus on solutions, not just problems; transdisciplinary.	Addressing the personal level, but linking to overarching ideas.	Whole-system approach to change not just incremental improvement.
Q5	A lot is done through the museum/ GreenCityBlueLake Institute.	Not enough; need overhaul of higher education.	More than there used to be; government departments are too separate.	Everyone needs whole-system focus, niche approaches miss the point.
Q6	Land use; climate.	Agreeing on a desirable shared vision.	Humanity's relationship to nature; need to envision better future not just sustain status quo.	Population; agriculture; built environment; generosity/sharing; education.
Q7	Challenge for leadership; tiered model might be good; grassroots.	All; especially push from lower and middle.	In the USA it won't be the government; self-replicating family/community model.	Whole-system, what is viewed as normal.
Q8	Everyday connection to nature; for Cleveland it is vacant land and waste water separation (opportunity for green waterway development).	Restore natural capital; requires 'silver shotgun' (i.e. multi-modal approach).	Vision for the future.	Change land use patterns (from two-dimensional sprawl, to a 3D city).
Q9	People not knowing the alternative.	Incentives are wrong (promote unsustainability).	Media's addiction to despair.	People being comfortable and resisting change.
Q9a	Yes, but it will take time.	Yes e.g. people's move away from smoking.	Yes; already seeing it with his 'children and nature' movement.	Sometimes e.g. the civil rights movement.
Q10	Better leadership.	Desirable shared vision.	Balancing life/ technology; focus on children.	Set examples.

	7	8 (snowball sample)	9	10
	P. Wesley Schultz	Kirsten Miller	Beverly Sandalack	Walter J. Hood
Q1	3,4.	4, all.	1,2,3,4.	1,2,3,4.
Q2	Psychology (initially political, but moved to environmental).	Humanities and music at university; journalism.	Landscape architecture/design, planning; gaps between disciplines.	Architecture.
Q3	Childhood; comparison of home town with sterile university town.	Free-range childhood; grandmother.	Childhood outdoors; university teachers.	Childhood, visiting relatives, and forest.
Q4	Environmental identity/connectedness to nature; social marketing; social norms re: nature.	Build environmental frameworks and networks.	Holistic; beyond disciplinary boundaries.	Equity/justice; benefit of design.
Q5	With community; but not with disciplines.	First step is to network to make change.	Could be better and more meaningful.	You have to be prepared to wear all the (disciplinary) hats.
Q6	Population; water; energy; climate.	Agreement to commit on climate; built environment.	Water; linking green infrastructure.	Justice/truth; human disconnection.
Q7	Top-down; individuals aggregated upwards.	Top-down frameworks; bottom-up contributions.	Comprehensive: start at top; planning, economics, education, and politics important.	First tier: political, economic, and institutional.
Q8	Opportunity to interact with nature every day.	City in balance with natural systems; water; parks.	Provide nature experience for all, and all will begin to value.	Depends on the person; design so that people notice and think about where they are specifically.
Q9	Perceptions; what is 'normal'.	Lack of common framework; vision of goal.	Conventional economics; political will; education of the public.	Sustaining the status quo and comfort versus letting go.
Q9a	Absolutely yes; no doubt.	Yes; we already have the information, we just need to be better organised.	Yes; needs to be faster.	Big change possible only when we're uncomfortable; incremental change in between times.
Q10	Change messages of what is 'normal'.	Create common vision; get companies on board.	Take what we <i>do</i> have and fill gaps in plan.	Catastrophe.

	11	12	13 (snowball sample)
	Randolph Haluza-DeLay	Bruce Morito	Aryne Sheppard
Q1	1,2,3.	Mostly 3, some 2.	Mostly 2, 3 some 1, 4.
Q2	Education; environmental education.	Environmental ethics.	Naturalist parent combined with interest and education in transformative education.
Q3	Spent time in nature (but this is not always needed).	Childhood, Dad, camping; professors at college.	Childhood camping etc.; biology teacher at school.
Q4	Focus on social equity and justice; problems and solutions.	Long-term solutions; identifying non-negotiable values.	Focus on experience versus intellectualisation; focus on awareness versus policies.
Q5	Disciplinary boundaries are policed e.g. in universities and publishing.	Doesn't go deep enough; can't be too radical or you will not be accepted; better between two people and informal; lack of common language is a barrier.	David Suzuki Foundation does it; people can get stuck - focusing on their own specific 'thing'.
Q6	Everyday life e.g. auto-mobility of society; linking equity/justice with sustainability; in Edmonton: oil sands.	Water; climate.	People's disconnect from nature.
Q7	Every level; focus on habitus (social learning).	Community; change in values won't be top-down.	Both, but mostly bottom-up (individual).
Q8	Nearby-nature rather than human/nature/urban separation.	Consciousness shift.	Local and daily activities; lots of small things.
Q9	Complexity of issue; political thinking.	The modern worldview and its failure to recognise nature.	Focus on economic growth.
Q9a	Yes, peaceful revolution is possible and can be rapid e.g. civil rights, peace, South Africa, Tahir square, Arab spring. Not easy, maybe crash first.	Yes; maybe with collapse; there are prior examples.	Yes, but it will get worse first.
Q10	Localisation; education.	Help people to recognise what they truly value; put pressure on decision makers.	Politics that is for the public versus for corporates; early education; make it personal for people e.g. through food, culture, consumption.

	14 (snowball sample) Blake Poland	15 Greg Searle	16 Juliet Schor
Q1	1,2,3,4.	1,2,3,4.	3,4.
Q2	Interested since grad school; Camino de Santiago was a turning point; noticed disconnect in adult life and wanted to transcend that.	Bedzed.	Labour/economics (e.g. work hours); linking consumption with ecological impacts; limits to growth; sociology.
Q3	Don't know; was a city kid; can't put a date on it.	Summer camp; aunts and uncles.	Husband mostly; contrasts with India's poverty/shortages; childhood in nature.
Q4	It's not about being unique; there is no best way - everyone should do whatever they can; unpacking embedded assumptions about these issues.	Pragmatic; what works versus dogma.	Macro (social and political) and micro levels (e.g. household, everyday, working hours, consumer choices); qualitative and quantitative.
Q5	Sees a lot of informal working relationships (prevalent but not necessarily best); formalisation tends to kill it.	Needs to be the way; silos cause problems; need better framework.	Conferences, policy, and literature all do; contemporary Western economics doesn't.
Q6	Consumption and perceived sense of scarcity.	Consumption; climate for now but others will follow.	Climate drives everything else.
Q7	All hands on deck; top-down policy meeting grass-roots/on the ground.	Yes (all).	Top-down (ideally carbon-cap) is the only way; citizens can push from the bottom; a lot of work at city level at the moment.
Q8	Invite people to become engaged e.g. through social events, or offering of specific skills; don't dictate what the 'best' way is.	Growing food; social capital.	Food, mobility and other things that excite people.
Q9	The taken for granted and historical anomalous practices of modernity that support status quo structures, economic systems, and vested interests.	Giving up what we know and love.	Politics; fossil fuel industry; politicised environmentalism.
Q9a	I don't know; some signs of change.	Crisis first.	Yes; other countries are doing it; some opportunity with climate and economic instability.
Q10	It's an open question.	Some people will set examples.	Climactic instability will affect economic security and force a response; the currently building movement will seem more legitimate.

	17	18	19
	Stephen Kellert	Janice Perlman	Margie Ruddick
Q1	2,3,4.	1,2,3,4.	1,2,3,4.
Q2	Biology/ecology and connection people have with it.	Anthropology of rural-to-urban transitions.	Architecture; moved sideways into landscape architecture.
Q3	Childhood e.g. in backyard (incited wonder).	Early life visits to impoverished places offered perspective.	Childhood contrast of home versus summers in British Columbia; Dad was environmentalist; Rachel Carson.
Q4	Similar to others looking at biophilia.	No right way; connect agents of change; spiral up from local to global.	On boundary of formal and informal organic design.
Q5	Some; looks like lots but need more; universities are siloed and their incentives are wrong.	Not enough; silos perpetuated by universities whose incentives are wrong.	Include people from the beginning; get help with things you're not good at.
Q6	Human nature interaction; what we value nature for.	Design; infrastructure.	Climate, sea level rise, and other flow-on effects.
Q7	Bottom-up; too much time and money for policy change.	All is best; can be anywhere but usually starts with those who are not benefiting; universities are equipped to do it.	Government/top-down; community/bottom-up; designers at all levels.
Q8	Direct, indirect, and representational forms of nature.	Educate kids about sources/sinks; green space.	Engage people hands on e.g. food, education centres, and kids outdoors.
Q9	Value systems e.g. human versus nature rather than humans in nature or humans are nature.	Real-estate profits as bottom line e.g. nobody makes money from a green park.	Interbody coordination; and people who join the dots.
Q9a	If we can demonstrate how it contributes to people's self-interest; other examples are promising e.g. anti-whaling movement.	There are many examples of where it is already happening.	Optimistic; governments will need to make unpopular decisions.
Q10	Empirical evidence; show people alternatives; show the true economics of environment.	Change politics and ideas; need government.	High profile pioneers e.g. Michelle Obama.

	20 Barbara Deutsch	21 (snowball sample) Clark Wilson	22 Tim Beatley
Q1	Mostly 1, 4, some 2, 3.	1,2,3,4.	Mostly 1, 4, some 2.
Q2	Marketing; volunteering; MA in urban ecological design.	Architecture and design consultant.	Planning; urban biophilia workshop.
Q3	Childhood e.g. in woods; role model in family (environmental attorney).	Storm water project at university.	Dad (mayor and visionary); being a pilot from young age gave landscape scale perspective.
Q4	Showing value through metrics that quantify the tangible (e.g. economic) benefits of environmental initiatives.	Based on statutory rules; activating community projects that meet requirements.	Plan for multiple goals; increase green in city and reduce ecological footprint.
Q5	Increasing; landscape architects often lead the way.	Trying to set an example; aligning resources across silos for more efficient and effective response.	Increasing; too many silos; reward system doesn't encourage it; difficult and costly.
Q6	Climate change; designed resilience; liveability.	Sea levels, storm water.	Climate change and its flow-on effects; how to create conditions where people can live better.
Q7	All over; need critical mass; leaders need to make a case for it and inspire others.	Both: find leaders; empower and inspire; include non-regulatory approaches.	No silver bullet; incentives from top-down; leave space for bottom-up.
Q8	Systems thinking; diversity of approaches (silver shotgun); imagining the benefits; physical connection with nature; education.	Beauty; make it feel nice to be in a city/place.	Biophilic cities; greening; balance with nature; living well.
Q9	People can't imagine alternatives; disciplinary silos; politics; economics as bottom line.	Funding and other mandates to think in silos e.g. traffic engineers focus on getting traffic through without considering pedestrians; need to rethink paradigms.	Politics; failure to have long-term vision; reduced ecological literacy; mainstream media; mainstream economics.
Q9a	It will take time.	Paradigm shift comes with demographic shift.	Yes; there are previous examples; question is: will it be fast enough?
Q10	Leadership; vision.	Paradigm change; policy change; political will; allocation of resources e.g. to green or grey infrastructure.	Perception that it's possible; compelling examples; bottom-up pressure.

	23	24 (snowball sample)	25
	Ellen Dunham-Jones	Mia Lehrer	Ingrid Stefanovic
Q1	1,4.	1,4.	1,2,3,4.
Q2	Architecture; saw need to raise the bar at the bottom.	Environmental design; planning.	Philosophy PhD; urban planning work-experience.
Q3	Childhood comparison of summers (in rural, uneducated area) versus home (in college town).	Childhood close to nature.	Childhood outdoors e.g. wonder; father (architect).
Q4	Focus on suburban areas (versus urban/downtown).	Multi discipline; all layers of city.	Taken for granted values in planning; beliefs that drive societal change.
Q5	More and more; economic crash has helped; silos at universities prevent it.	She wants more, but clients don't like to pay for it.	Critical; she does it.
Q6	Climate; air; water; sprawl; land use.	Water; sprawl.	Taken for granted values in planning; beliefs that drive societal change.
Q7	If politics is good, top-down, if not, bottom-up.	All levels; none can solve issues alone.	Some top-down; mostly bottom-up; help people to understand behaviour and values.
Q8	Street trees are the 'low hanging fruit'.	Good planning; respect for natural resources; trees; connectivity of ecologies.	Physical changes and perception changes hand-in-hand; reference to her own book.
Q9	Culture (resistance to change).	Political leadership; financial investment.	Understanding attitudes and modifying them.
Q9a	Optimistic (with upcoming demographic change).	Maybe in two generations; political division can be a barrier.	Yes, but it takes time e.g. we have come a long way from environmentalism in the 1970s.
Q10	Demonstrate alternatives; value shared space.	A politically active generation with tools to push an agenda; trees; cities at manageable/relatable scales; ripple of understanding from local out to global.	Education; behaviour change e.g. through professional development.

APPENDIX 13

EXAMPLES OF EXPERTS' IDEAS ABOUT CHANGE

This list exemplifies a variety of different ways that experts foresaw socio-ecological (and other) forms of societal change proceeding in Western cities in the future. My research aim and corresponding analytical framework focused on pragmatic and intentional ways that change can be made, seeking to identify key barriers to sustainability, strategic solutions to these, and pragmatic everyday actions that could provide pathways to realising these solutions. These are the focus of the thesis. I do not present results or provide in-depth discussion of primarily unintentional, uncontrollable, unworkable, or perceivably utopian modes of change.

Expert discussion around change included:

- How it is psychologically and socially hard to intentionally change what you are routinely accustomed to doing.
- Historical examples of change especially radical change like the civil rights movement, anti-whaling, and anti-nuclear movements, change away from cigarette smoking, and the ‘don’t mess with Texas’ campaign, which partnered with musicians, athletes, and other celebrities to reduce litter, especially along the state’s highways, appealing to state-wide pride and identity.
- The role of the media and advertising in influencing change.
- The role of peer pressure in influencing change.
- How positive examples and trailblazers can encourage people to change.
- The role of enforced change to laws, regulations, and incentives that come from the top down. Carbon-capping legislation at a federal level was an example that arose more than once and was often viewed as a futile dream for the USA at least.
- Demographic or generational change in cities. Examples include:
 - fewer Western households now have kids in them than previous generations, so their needs are different, and
 - young people today want different things to what existing cities are offering them e.g. they would prefer to use public transport rather than drive so that they can use their digital devices, and
 - many western countries have an ageing population, and living in the suburbs can be isolating for the elderly, particularly if they don’t have the independence provided by driving.
- The role of technology as part of change. This had both negative connotations (e.g. children spend more time watching television than they do outdoors) and possible positive applications, for example creating games that simulate real world sustainability problem-solving or using real-time technological monitoring to improve public transit (e.g. assessing where pedestrians are waiting, and sending additional train carriages).
- Catastrophic economic or ecological collapse and how this would force change.

APPENDIX 14

TABLE SUMMARISING THREE BACKCASTED PATHWAYS

	Everyday starting points towards sustainable ecological habitus could include:	If routinized, practices could incrementally contribute to overcoming the following barriers to sustainable ecological habitus:	Overcoming these barriers could enable the realisation of the following visions for sustainable future cities:
PRAGMATIC PATHWAY 1	Collaborative everyday practices by city authorities to build their own ecological capitals, particularly ecologically salient interdisciplinarity and conscious/critical ecological reflexivity. Beginning, for example, with attending socio-ecological talks, to concerted reflection in classrooms, to collaborative action-research in communities, and the development of interdisciplinary programs, career pathways, and publications.	Doxic disconnection between the disciplinary silos within city authorities (individual and institutional), which can preclude critically ecologically reflexive, whole-systems approaches (e.g. by externalizing or under-recognizing the fundamental and pervasive significance of natural capital and socio-ecological interconnection), and materialise within cities (informing the habitus of city citizens) when authorities structure capitals (e.g. information, material resourcing, and infrastructure).	City authorities are critically ecologically reflexive, contributing to leadership and integrated advancement of sustainable ecological habitus in cities from the top-down, for example by incorporating ecological sustainability into the habitus of upcoming generations (e.g. via education); into the organisation, design, and operation of cities; and into capital investments (e.g. infrastructure, research, innovation, enterprise etc.); contributing to ecological and natural capitals, and exemplifying, enabling, and encouraging sustainable ecological habitus within city citizens.
PRAGMATIC PATHWAY 2	Enrichment of qualities and quantities of natural capital and ecosystem services in cities by diverse agents. For example, greening a street-front home garden, planting street trees, conserving and connecting native ecosystem fragments, and/or constructing new ecological feature or networks.	Doxic disconnection of people from natural capital in cities, which potentially lessens people's opportunities for multi-sensory nature-connection practices within their everyday environments, and can reduce or preclude forms of ecological reflexivity; ecological dispositions (e.g. inclination to care for/protect the natural world); and ecological capitals (e.g. understandings and skills) that could inform and empower ecologically sustainable practice.	Cities are enriched with natural capital, contributing directly to strong-sustainability, and enabling first-hand, routine, and equitable practices of human-nature connection within people's everyday environments, predisposing people to sustainable ecological habitus from a young age, while supporting ongoing development of the same.
PRAGMATIC PATHWAY 3	Self-valued and self-disposed, small ecological actions by people in mainstream city fields. For example, opting for shorter showers to save electricity and water, buying local produce from community gardens or markets to build community connections and save on human and produce transport emissions, or watching environmental films to support a cause (symbolically, financially, and/or socially) while building ecological knowledge and learning new ideas for practice.	Doxic disconnection of the mainstream of city people from existing sustainability fields (and accompanying capitals, practices, reflexivities etc.), which potentially disempowers or disenchant people from engaging with sustainability, lessening ecological democracy and people's dispositions for sustainable practice, and resulting in the doxic reproduction of unsustainable practice and unsustainable variants of ecological habitus.	People within mainstream city fields incrementally add to their own sustainable ecological practices, developing ecological capitals and lessening their net footprint on natural capital, thereby becoming engaged individually and embedded socially in the transition towards sustainable ecological habitus, and enabling fuller-spectrum societal change.

APPENDIX 15

LIST OF QUESTIONS TO PROMPT CRITICAL ECOLOGICAL REFLEXIVITY (CRITER)

1. What were the routine ecologically relevant dispositions and practices in your formative social fields?

Examples:

- How did your family or people in your early education think about, discuss, and/or behave with regards to landforms, ecosystems, plants, and animals?
- What ecological norms and ideals emerged from these considerations? How were these included or excluded from your everyday life?
- Where did you get your water, food, and energy from and what were the ecological effects of these resources being extracted or harnessed?
- How did the resources get to you?
- How did you transport yourself?
- What were the environmental effects of these modes of transmission and transportation? What waste did you create in using the above resources, and in general?
- How was this waste disposed of?
- What were the effects of its disposal on the natural environment?
- What other life activities with ecological effects were modelled to you (e.g. economic behaviours, identities, beliefs, and future goals), and were they ecologically attuned, antagonistic, benign, apathetic etc.?

How have you embodied these social constructions of ecological habitus?

Examples:

- To what degree are the foundational dispositions and practices (from Q1) reproduced or transformed in your current everyday life, and why?
- How do your ecological dispositions compare to those of people you view as being similar or different to you?
- Have you intentionally reflected on where your ecological dispositions and practices came from?
- Have you sought actively to change them? Which ones, and why/why not?

How are your ecologically relevant dispositions and practices supported or challenged by the social fields (e.g. family, friends, work, church, or clubs) that you now inhabit?

Examples:

- How do your regular, occasional, and/or ideal ecological practices compare to people around you? For example, do you recycle, compost, bicycle, drive, conserve energy, have insulation, use pesticides, eat organic/vegan/vegetarian/local, or buy products tested on animals?

- What kind of cleaning products do you use?
- Where do your clothes come from, and what are they made of?
- Where do you holiday, and how do you get there?
- What are the ecological effects of these things?
- Do you participate in alternative social fields where factors of your ecological practice are challenged?
- Which aspects have been challenged/not challenged?
- How do social/other media inform your ecological reflexivity and/or practice?

What capitals (economic, social, cultural, and symbolic) do you possess/lack and how do you deploy them to enact your ecologically relevant dispositions in practice?

Examples:

- If you had a higher/lower income, would you be more/less able to carry out ecologically sustainable practices?
- How do you deploy your financial resources now (e.g. consumer behaviour, investments, donations), and what are the ecological effects of this?
- If you own a house, how sustainable is it and have you invested in its sustainability (e.g. compost systems, insulation, solar panels, rainwater collection)?
- Are you involved in environmental organisations where you can learn from others and routinely engage in socially supported ecologically sustainable practices?
- What knowledge do you have of local/national/global ecologies and the challenges facing them?
- How do city infrastructures enable/prevent you from practicing ecological sustainability (e.g. how is your electricity generated, does your city offer centralised recycling or composting services)?
- Are the city institutions (e.g. workplaces, schools, gyms, supermarkets, farmers markets, power companies, political group, banks, etc.) that you engage with recognised for their ecological sustainability (e.g. Enviro-mark NZ, ISO certification, BREEAM, LEED etc.)?

In addition to the effects of your practices on the ecological environment, what effects does natural capital (i.e. ecological environments, resources, and services) have on your everyday life, dispositions, capitals, practices, fields, and reflexivities?

Examples:

- What effects do ecologies have on you? These include ecosystem services that create clean air and water; immersion in natural capital such as time at a beach or in a forest; health implications of beneficial or harmful bacteria or parasites; effects of weather on

your day-to-day life; climatic mitigation offered by trees or landscape features including shade and wind buffering; the emotional effects of interacting with animals (e.g. pets); and/or contributions to products that you consume (e.g. bees creating honey and pollination of fruits such as tomatoes).

How do your ecological practices contribute to the construction of ecological reflections and actions in each of your social fields, and how might this affect the collective/individual ecological practices of these fields/others in these fields into the future?

Examples:

- How do you mediate the interactions of young people/children in your family, community or other fields whose ecological habitus is still forming? For example mediating their direct interactions with natural capital (including outdoor activities, food sources, transportation, and pets etc.), or otherwise inform their ecological understandings (e.g. through shared reading, other learning experiences, or importantly, by example?
- Do you hold power, status, authority, or respect within a social field, such that you influence or materially affect other people's ecological practices? This might include economic behaviours, financial investments, life activities, future goals, or everyday practices such as transportation, selection and acquisition of food, energy use etc.
- Do you communicate with people in your immediate social fields about these issues?

APPENDIX 16

LIST OF PRAGMATIC IDEAS FOR IMPROVING COLLABORATION

When to collaborate

- Teaching and supervision.
- Conferences, discussions, reading groups, and other forums.
- Advisory committees.
- Writing, publishing, and communication by other media.
- Planning and design.
- Research and development.
- Applied projects and case studies.
- Policy and program development.

Who to collaborate with

- Other leaders from different institutions.
- Interdisciplinary fields (e.g. policy, resource management, and ecological economics).
- Complementary disciplines, which address relevant topics that are currently externalised from your own discipline.
- Disciplines that may contribute divergent solutions to a problem you seek to address.
- Community or indigenous groups or organisations.
- Underprivileged groups or those facing socio-ecological challenges day-to-day.

How to improve collaboration

- Begin with informal, small-scale, and convenient interactions (e.g. meet for coffee) with people from other disciplines to begin to learn divergent terminologies, perspectives on issues, and problem-solving approaches, and to heighten your awareness/reflexivity of your own disciplinary socialisations.
- Work together with other disciplines on projects ‘on the ground’ to strengthen your practical capacities for collaboration and gain insight into the practical context that surrounds other disciplines’ theories, methods etc.
- Visit collaborative projects, attend collaborative meetings, and otherwise observe collaboration and what makes it work (or not work).
- Include an interdisciplinary facilitator (someone experienced in linking the fields you seek to traverse) to translate terminologies/jargon and otherwise enable the collaborative process.
- Use or develop terminologies and metrics that can be understood by others (e.g. other disciplines or the public).
- Showcase your discipline’s unique value to solving common problems in accessible ways to inspire interdisciplinary interest from others.
- Utilise technology (e.g. video calling, cloud storage) to collaborate over distance.
- Include other disciplines from the inception of a project to enable interdisciplinary conceptualisations and comprehensive integration of different components.
- Appeal to different disciplinary funding streams and showcase the co-benefits of collaborative approaches to improve funding potential (e.g. a collaborative research project might appeal to funding streams related to the project’s science, communication, applied value, teaching potential, etc.).

APPENDIX 17

LIST OF METHODS FOR INCREASING THE QUANTITY AND QUALITY OF NATURE IN CITIES

List of methods for increasing the quantity and quality of nature in cities, derived from the expert interviews.

• Create community orchards, community gardens, urban farming, multi-storied greenhouses. • Apply principles of permaculture. • Replace residential lawns with a greater diversity of species that are more resilient to local conditions (e.g. xerophytic dry-tolerant or hardy wild-types) and require fewer inputs (e.g. fertiliser, pesticide, irrigation). • Create green roofs and rooftop gardens. • Favour green storm-water infrastructure and processing systems (e.g. deep tree wells, roadside swathes). • Plant vegetation across vacant lots, derelict land, and marginal space. • Insert micro sized ‘pocket parks’ everywhere possible. • Plant urban forests/woods and combine these into an integrated and continuous tree network. • Create vegetated pathway and recreational networks. • Preserve long views and undisturbed, expansive sky-scapes. • Incorporate bio-inspired technologies (e.g. for air circulation and recycling).	• Create, preserve, and restore wildlife habitat (large patches through to small fragments) and wildlife corridors. • Restore and preserve native vegetation and ecosystems. • Reinstate natural hydrological systems including increasing permeable surfaces, restoring wetlands, and daylighting streams, rivers, and other waterways. • Buy up and revegetate riparian margins and watersheds. • Subsidise developers who retain green space (>30% was proposed as a metric). • Legislate for compulsory planting of trees in undeveloped land banked areas. • Incorporate representational and symbolic forms of nature indoors and outdoors (e.g. art work, or motifs). • Incorporate natural materials (e.g. living walls, unpainted wood, natural stone).
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