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<https://doi.org/10.25903/zwmx%2Dgr83>

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**Connecting to nature in the digital age:
A cross-cultural study of pro-environmental individuals
in the United States and in Australia**

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Thesis submitted for the degree of Doctor of Philosophy

Histoire et Dynamique des Espaces Anglophones

Sorbonne Université

College of Arts, Society and Education

James Cook University

2021

Acknowledgements

To get through the hardest journey we need take only one step at a time, but we must keep on stepping.

Chinese proverb

When you are lying on your deathbed, one of the cool things to say is, 'I really explored myself'. This sense of urgency was instilled when my mother passed away at the beginning of the PhD. If you only go through life doing stuff that is easy, shame on you. This PhD has been an amazing, beautiful, soul-stretching journey that took place between two continents, Europe and Australia. This unbelievable adventure would not have been possible without the support of my supervisors both in France and in Australia. To Olivier Frayssé, Yves Figueiredo, Maxine Newlands and Simon Foale, thank you from the bottom of my heart. You helped me achieve one of my dreams to not only do a PhD but to do it across two countries.

I want to thank my loving family in France who provided unwavering support while I was living on the other side of the globe, and especially my partner and friend who stood by my side through all the hard times. You are my roots wherever I go and this foundation has always helped me spread my wings and dream bigger. This thesis, which I have achieved to write in very tumultuous times, is particularly dedicated to my mum and my stepfather. Words fail me to describe how much I miss you...

I want to add a special word to Max, my brilliant, funny, sparkling supervisor, and now friend. You have been such a light throughout everything that happened during this PhD. You helped me stay focused and grounded when things were tough and I was away from home, and you helped me stay positive when everything in my personal life was falling apart.

And a last word for all the wonderful, soulful persons who took part in this research, the 220 participants who agreed, both in Australia and in America, to share with me their thoughts and beliefs in such an open and honest way, and from whom I learned so much.

Thank you.

Statement of the Contribution of Others

This thesis has been made possible through the support of the following persons:

Supervisors at Sorbonne Université

Principal Supervisor

Professor Olivier Frayssé

Histoire et Dynamique des Espaces Anglophones

Co-Supervisor

Associate Professor Yves Figueiredo

Histoire et Dynamique des Espaces Anglophones

Supervisors at James Cook University

Principal Supervisor

Dr Maxine Newlands

College of Arts, Society and Education

Secondary Supervisor

Dr Simon Foale

College of Arts, Society and Education

Financial support

JCU Postgraduate Research Scholarship

JCU College of Arts, Society and Education Allocation

CASE Completion Grant

Abstract

This thesis aims to understand how pro-environmental individuals engage with nature in the digital age. Understanding how human beings define themselves in relation to nature – whether the concept of human/nature dualism is still prevalent in Western culture – and the extent to which digital technology impacts the human-nature relationship were also key themes for this research. A universal relationship with nature encompasses both nature’s ability to nurture us, through our contact with natural places, and our ability to reciprocate this therapeutic connection by preserving the environment. Yet, there is mounting evidence indicating that people’s direct contact with nature is diminishing. A lack of experiences in nature, especially in digitalised and urbanised environments, may have negative consequences for people’s pro-environmentalism and could lead to detrimental consequences for the environment. The study explores whether a Western construct of human/nature dualism, which defines humans and nature as separate, is still at the root belief of modern human-nature relations and online environmental advocacy and activism. It also investigates the diverse physical, mental and emotional dimensions of the human-nature bond. The thesis reports on a cross-cultural mixed methods approach research conducted with pro-environmental individuals selected from ecovillages, urban farms, environmental organisations, community gardens and zero waste initiatives across Australia and the United States. North America and Australia were chosen as sites of study because they share the characteristics of having both industrialised, urban areas and extensive wilderness. They both come from European settlements and share their territories with indigenous populations, and these geographical and historical qualities make nature an important part of their cultural identities. Participants were chosen for the way they demonstrated pro-environmental behaviours, and on the basis that they were digital users and used digital technology for eco-activism. Pro-environmental behaviours (PEBs) are defined as behaviours in which individuals take protective actions toward the environment (e.g., recycling, purchasing local food, conserving water, buying an electric vehicle, building an off-grid home, etc.). Data was collected through an online survey of 220 respondents and follow-up interviews with 20 participants. Analysis of the quantitative and qualitative data suggests that, even though participants still hold beliefs related to a human/nature separation, their views also consider human self as integrated to nature in accordance with concepts such as environmental identity and connectedness to nature. Nature is seen as both material in its form and a cultural construct, and is understood through its processes as an ecological system of interactions to which human beings are connected. Digital technology is

Connecting to nature in the digital age

predominantly described as a useful tool to an ecocentric view of reality (i.e. focused on human-nature interdependence) and as a positive way to connect to nature. Participants used the Internet in a minimalistic way to be inspired, share on conservation-related subjects, and feel part of an online community that emphasises eco-activism through mundane everyday routines, and that promotes action on an individual level. Yet, some negative aspects of connectivity were also pointed out. An important finding of the study was the concept of digital solastalgia (i.e. the distress felt when hearing about global ecological issues online). Digital nature (i.e. the experience of nature online), just like real nature, reflects the current ecological crisis. Participants intentionally used the Internet to search positive experiences of nature (such as documentaries, inspiring pictures, articles promoting human nature, etc.), yet, most of them also experienced digital solastalgia when checking the news, or social media. This study provides evidence of the importance of environmental cultural norms and nature exposure (especially in childhood) in fostering pro-environmental values and behaviours both online and offline. It indicates that time spent in nature leads to increased connectedness to nature, greater pro-environmental behaviours, and that it positively impacts digital habits, fostering a moderate and balanced use of digital technology. It shows that both natural systems (via nature exposure) and cultural systems (via digitalism) influence the human-nature relationship.

Table of Contents

<i>Acknowledgements</i>	ii
<i>Statement of the Contribution of Others</i>	iii
<i>Abstract</i>	iv
<i>Table of Contents</i>	vi
<i>List of tables</i>	xii
<i>List of figures</i>	xiii
Chapter 1. Introduction	1
1.1. Rationale	1
1.2. Aims and objectives	7
1.3. Methodological approach	8
1.4. Structure of the thesis	8
Chapter 2. Literature review	10
2.1. Introduction	10
2.2. Faking nature: The Western myth of wilderness	11
2.2.1. <i>The romanticised idea of wilderness</i>	11
2.2.2 <i>The human/nature dualism</i>	13
2.2.3. <i>The role of language</i>	14
2.2.4. <i>Debunking the Western myth of wilderness</i>	16
2.3. Environmentalism and the machine	18
2.3.1. <i>The age of ecology: Birth of the environmental movement and the National Park ideal</i>	18
2.3.2. <i>Sustainability and the machine: The limits of the environmental movement</i>	19
2.3.3. <i>The capitalist spirit and the Anthropocene</i>	22

Connecting to nature in the digital age	
2.3.4. <i>Ecofeminism: Women and nature</i>	24
2.4. Forward to nature: Healing the lack of nature in the digital age	26
2.4.1. <i>Nature-deficit disorder</i>	26
2.4.2. <i>The identity crisis: Mind over body</i>	28
2.4.3. <i>The silent pulse: From mind back to body and beyond the human/nature dualism</i>	30
2.5. Conclusion	33
Chapter 3. Methodology	34
3.1. Introduction	34
3.2. Research design	34
3.2.1. <i>Cross-cultural mixed methods research</i>	34
3.2.1.1. Mixed methods characteristics.....	35
3.2.1.2. Cross-cultural comparative research.....	36
3.2.2. <i>Cross-cultural sequential explanatory design</i>	38
3.2.3. <i>Netnography: Research and digital technology</i>	40
3.3. Data collection	41
3.3.1. <i>Phase One: Cross-sectional online survey</i>	41
3.3.1.1. Participants (United States – Australia).....	42
3.3.1.2. Pilot study.....	45
3.3.1.3. Survey questionnaire.....	46
3.3.1.4. Survey procedure.....	48
3.3.2. <i>Phase Two: In-depth interviews</i>	49
3.3.2.1. Participants (United States – Australia).....	50
3.3.2.2. Data collection.....	51
3.3.2.3. Interview questionnaire.....	52

3.3.2.4. Preparing and conducting interviews.....	53
3.3.2.5. Management of interview data.....	54
3.4. Data analysis.....	55
3.4.1. <i>Quantitative strand: Descriptive statistics</i>	55
3.4.2. <i>Qualitative strand: Thematic analysis</i>	57
3.4.2.1. Familiarisation with the data.....	57
3.4.2.2. Generation of initial codes.....	58
3.4.2.3. Searching for, reviewing and defining themes.....	59
3.5. Ethics.....	62
3.6. Conclusion.....	63
Chapter 4. Quantitative findings.....	64
4.1. Introduction.....	64
4.2. Response rate.....	64
4.3. Demographic characteristics of the survey participants.....	65
4.4. Nature beliefs.....	74
4.5. Internet habits and beliefs.....	83
4.6. Conclusion.....	87
Chapter 5. Qualitative findings.....	89
5.1. Introduction.....	89
5.2. Demographic characteristics of the interviewees.....	89
5.3. Themes.....	89
5.3.1. <i>Connectedness to nature</i>	90
5.3.2. <i>Nature as other</i>	94

Connecting to nature in the digital age	
5.3.3. <i>Environmental education</i>	98
5.3.4. <i>Ecological emotions</i>	104
5.3.5. <i>Digital mindfulness</i>	109
5.3.6. <i>Digital solastalgia</i>	113
5.4. Conclusion	116
Chapter 6. Discussion Part One: Nature	117
6.1. Introduction	117
6.2. The cognitive dimension of nature: The physical expressions of the environment	117
6.2.1. <i>Nature categorisation and contemporary definitions</i>	117
6.2.2. <i>Nature, wilderness and the bush</i>	121
6.3. The normative dimension of nature: Nature and ethics	124
6.3.1. <i>Nature as God's creation</i>	126
6.3.2. <i>Nature as a resource</i>	128
6.3.3. <i>Nature as an ecosystem</i>	130
6.3.4. <i>On environmental sustainability</i>	133
6.4. The expressive dimension of nature: Aesthetism and emotions	135
6.5. American and Australian similarities and differences and conclusion	139
Chapter 7. Discussion Part Two: Culture	141
7.1. Introduction	141
7.2. Shifting worldviews: From the Dominant Social Paradigm to the New Environmental Paradigm	141
7.3. Collective belief and cultural behaviour	146
7.4. Culture and the self	150
7.4.1. <i>Self-construals</i>	150

Connecting to nature in the digital age	
7.4.2. <i>Individual agency and self-efficacy</i>	153
7.5. Nature exposure as culture-shaping	154
7.6. Toward a global cultural ecology	156
7.6.1. <i>Culture and globalisation</i>	157
7.6.2. <i>The spiritual dimension of the human-nature bond</i>	158
7.7. Culture, wonder and awe	160
7.8. American and Australian similarities and differences and conclusion	162
Chapter 8. Discussion Part Three: Digital Technology	164
8.1. Introduction	164
8.2. Culture and society in the digital age	164
8.2.1. <i>Toward a digital society</i>	165
8.2.2. <i>Connected individualism in contemporary society</i>	165
8.2.3. <i>Transparisation</i>	167
8.2.4. <i>Cognification (intellectualisation of the surrounding environment)</i>	168
8.3. Digital technology and the human-nature relationship	170
8.3.1. <i>The Fourth Industrial Revolution and the human-nature connection</i>	170
8.3.2. <i>Sense of place, belonging and cyberspace</i>	171
8.3.3. <i>Digital technology and environmental sustainability</i>	174
8.3.4. <i>Digital technology, embodiment and mind/body disconnect</i>	179
8.4. Nature, digital technology and wellbeing	179
8.4.1. <i>Nature exposure and digital technology</i>	179
8.4.2. <i>Digital technology and conceptions of time</i>	181
8.5. American and Australian similarities and differences and conclusion	183
Chapter 9. Conclusion	185

Connecting to nature in the digital age	
9.1. Addressing research questions	185
9.2. Research limitations	189
9.2.1. <i>Methodological and theoretical limitations</i>	189
9.2.1.1. Sampling	189
9.2.1.2. Generalisability	190
9.3. Research contribution	191
9.3.1. <i>Theoretical and methodological contributions</i>	194
9.3.1.1. Nature, digital technology and human identity	194
9.3.1.2. Gender divide in environmental attitudes	195
9.3.2. <i>Empirical contributions</i>	196
9.3.2.1. The effects of nature exposure on digital habits	196
9.3.2.2. Digital solastalgia and the effects of digital technology on the human-nature relationship	196
9.3.2.3. Online pro-environmentalism and digital exclusion	197
9.4. Future research	198
9.5. Conclusion	200
<i>References</i>	201
<i>Appendices</i>	247
<i>Appendix A: Online survey</i>	247
<i>Appendix B: Interview information sheet</i>	256
<i>Appendix C: Interview informed consent form</i>	258
<i>Appendix D: Interview questions</i>	260
<i>Appendix E: Conversion of annual income categories for Australia and the United States</i>	262
<i>Appendix F: Conferences and publications</i>	264

List of Tables

Table 1. Methodological overview of the survey questionnaire.....	47
Table 2. Coding examples for the ‘Connectedness to nature’ theme.....	62
Table 3. Demographic characteristics of American and Australian respondents.....	73
Table 4. Demographic characteristics of the American interviewees.....	90
Table 5. Demographic characteristics of the Australian interviewees.....	91
Table 6. Views of nature in the Hebrew Bible.....	128
Table 7. Contrasting DSP and NEP.....	144
Table 8. Comparative table of interactions between nature, culture and digital technology in Australia and the US.....	193
Table 9. Conversion of annual income categories from US\$ to AU\$.....	262
Table 10. Conversion of annual income categories from AU\$ to US\$.....	263

List of Figures

Figure 1. The six dimensions of national culture for Australia and the United States.....	6
Figure 2. The cross-cultural design.....	39
Figure 3. Wordcloud of American answers to SQ 13.....	60
Figure 4. Wordcloud of Australian answers to SQ 13.....	61
Figure 5. Locations of respondents in the US.....	66
Figure 6. Locations of respondents in Australia.....	66
Figure 7. Age of survey respondents.....	67
Figure 8. Gender of survey respondents.....	68
Figure 9. Education levels of survey respondents.....	70
Figure 10. Annual household income of American respondents.....	72
Figure 11. Annual household income of Australian respondents.....	72
Figure 12. SQ 12 – Do you agree or do you disagree on the definition of wilderness proposed by the American Wilderness Act of 1962?.....	75
Figure 13. SQ 15 – Have you ever experienced solastalgia?.....	77
Figure 14. SQ 16 – Do you see yourself as being separate from nature or as being part of nature?.....	78
Figure 15. American respondents on being separate from or part of nature.....	79
Figure 16. Australian respondents on being separate from or part of nature.....	79
Figure 17. SQ 17 – Do you consider humans’ modern creations as part of nature?.....	80
Figure 18. Respondents on how they define themselves.....	81

Figure 19. SQ 21 – Do you think there is any truth to the concept of human/nature dualism?.....	82
Figure 20. SQ 22 – In a typical day, how much time do you spend using the Internet?.....	83
Figure 21. SQ 23 – In a typical day, how often do you check your emails?.....	84
Figure 22. SQ 24 – In a typical day, how often do you check social media?.....	85
Figure 23. SQ 27 – Has digital technology helped you have a deeper relationship with nature, or has it prevented you from having a deeper relationship with nature?.....	87
Figure 24. Qualitative findings based on SQ 13 (Can you give your own definition of nature?).....	95
Figure 25. Qualitative findings based on SQ 10 (Was there a particular event that made you change to a more environmentally friendly lifestyle?).....	99
Figure 26. Qualitative findings based on SQ 17 (Do you consider humans’ modern creations as part of nature?).....	105
Figure 27. Qualitative findings based on SQ 25.....	110
Figure 28. The “continuum of wildness”.....	120
Figure 29. Estimated data created on the Internet in one minute.....	175
Figure 30. The humanature identity triangle in relation to digital technology.....	192

1. Introduction

1.1. Rationale

The separation between human and nature

Why do we separate from nature? This is the question that started the research. Being born and raised in a Western society, even before we can learn about sociological concepts and philosophical trends, we are taught to grow apart from nature. It comes subtly throughout the years. There are no lessons on how to split from nature, but Western society is built on this negation and the mind integrates beliefs best when they are physically experienced over and over again (Frank and Kuhlmann, 2017). Seeing nature and humans as estranged is inherent to Western culture (Callicott and Nelson, 1998; Cronon, 1995). We end up as adults in a partial state of disconnection, which is reinforced by urban infrastructures that make exposure to nature difficult on a daily basis. When I started on this research, the initial goal was to deconstruct the mental schemes that keep us locked out of what has often been called the background of human life (Plumwood, 1993; Rose, 1996) but what is actually life itself: nature.

The human/nature dualism is a key concept in environmental sociology. It defines human and nature as separate and distinct. Daniel Vitalis (as cited in Asprey, 2018) argues that humans today are not actual *Homo sapiens* but a domesticated subspecies. He explains that modern humans are born in captivity. They eat a diet of domesticated food and are trained to produce products, services, and taxation money until they die. In his view, modern society is like a factory farm for humans. Like Vitalis, a growing number of persons – from authors and academics to eco-activists and nature lovers (Cronon, 1995; Naess, 2016; Nash, 1976; Plumwood, 2002; Williams, 2017) – denounce our estrangement from nature. This trend toward a human-nature reunification, which grew as a reaction to the general Western view that nature and human are opposed, is not new. There has always been a counterculture embedded in the dominant Western culture since the human civilisation entered the industrialised era and also before that. From Thoreau who fled the noise of town in his wooden cabin in the 19th century to Sigurd Olson (1998, p.101) who depicted the speed and pressure of early 20th century life as “senseless”, from Scott and Helen Nearing who, in the 1950s, left comfortable positions in New York to become farmers in Vermont – initiating the back-to-the-land movement – to Bill McKibben (1989, p. 58) who recently lamented that we have changed the atmosphere and thus we are changing the weather, and that “by changing the weather, we make every spot on earth man-made and artificial”, nature has long been depicted as an antidote to our human selves. Or, as William Cronon (1995, p. 69) says “an island in the polluted sea of urban-industrial modernity, the one place we can turn for escape from our own too-muchness”.

The separation between human and nature, and what I refer to as the human/nature dualism, can bear several titles, from the human-nature divide to the nature/culture split, the man/nature dualism, or the human/nature dichotomy. When only focusing on the concepts of human and nature, there is still debate over whether to use the expressions ‘human/nature’, ‘human-nature’ or even ‘humanature’ (Dickinson, 2013; Haraway, 2003; Milstein, 2011). The recent field of ecolinguistics, which emerged in the 1990s as a new paradigm of linguistic research, takes into account not only the social context in which language is embedded, but also its ecological context. As ecolinguists (Abram, 1997; Muhlhausler, 2003; Verhagen, 2008) demonstrate, the words we use play an important role in our perception of reality. The words that have been used for centuries in human civilisation have helped to create the current human/nature disconnect, this is why researchers like Albrecht (2019) emphasise the need for a new lexicon to manifest a positive human-nature relation. An important aspect of this discussion is the nature versus culture debate (Pinker, 2002). In this respect, it is interesting to understand what the nature-culture divide implies and whether or not it differs from my choice of the expression human/nature dualism. Culture has been described by Greenwood and Stini (1977) as man’s secret adaptive weapon. A theoretical foundation of modern anthropology, the nature-culture divide is intertwined with the social versus biological debate. While nature is influenced by genetic inheritance and biological factors, nurture is described as the influence of external factors such as social experience and learning on an individual level. But as Moore (2003, p. 68) writes, “it’s not nature vs. nurture, it’s both”, proposing that both genes and the environment contribute, in an integrated manner, to the traits that an organism finally develops. Moreover, the term *nature* is not a simple concept. As this study will show, its definition is evolving along with the reality it aims to pin down. When describing the physical environment, the concept is in itself an evolving nature submitted to biological evolution laws. Nature also has, in a historical perspective, different meanings in different cultures. It has been observed that the word *nature* cannot be translated into several non-Western languages. For example, the Native American John Mohawk (as cited in Nelson, 2008, p. 48) describes nature as “anything that supports life”. Though initially nature was described as that part of the world that humans had not made, it has now become part of an artificial world built by humans and technology (Crist, 2013; Hayles, 1995). This can make it difficult to distinguish clearly between what is natural and what is not. Overall, I use the expression human/nature dualism as encompassing the nature-culture divide (culture being an expression of the human world). I will now explain how digital technology is another facet of modern culture.

On the Internet (digital technology and culture)

In September 2016, blogger Andrew Sullivan wrote an essay for *New York Magazine* titled “I used to be a human being.” Its subtitle was: “An endless bombardment of news and gossip and

images has rendered us manic information addicts. It broke me. It might break you.” The article was widely shared and describes the advent of digitalism. Digitalism (also known as digitality) is the condition of living in a digital culture. It is, for Negroponte (1995), a new era, analogous to modernity and post-modernity. Aspects of digitalism include near continuous contact with other people through cell phones and other digital devices, and near instantaneous access to information through the World Wide Web (Bowen and Giannini, 2014). Throughout human history, technologies of communication have had a significant impact on culture. The digital revolution, that started at the end of the 1990s, has made owning digital technology and interacting with the rest of the world on a virtual mode the new norm. Digital technology is now familiar, taken-for-granted, or as Kozinets (2015, p. 17) claims, ‘natural’: “The latest technologies, it seems, have become natural, even ‘human nature’”. And the prevalence of social media also means that online sociality has become a part of the overall social behaviour.

I want to make clear that (1) digital technology as per se are mostly useless tools if not connected to the Internet, so when we talk about digital technology, what we are really talking about is Internet connection, (2) Digital technology and the Internet are cultural expressions of contemporary Western civilisation. So, they are at the core of the 21st century nature versus culture debate. The Internet, and digital technology defined as the tool to access the Internet, are culture in the sense that culture is borne through human beings and their communications (Amit and Rapport, 2002). The Internet, as a communication tool, is the most defining cultural characteristic of contemporary Western societies. This relationship is a work in progress where both humans and technology play a part. As Kozinets (2015, p. 24) writes, digital technology defines human behaviour as much as it is defined by it:

The insight that technology does not determine human social behaviours, but that technologies and human beings are co-determining, co-constructive agents is a crucially important one to anthropologists who study science and technology. With our ideas and actions, we choose technologies, we adapt them and we shape them, just as technologies alter our practices, behaviours, lifestyles and ways of being.

For the purpose of this introduction, I want to provide the reader with a basic definition of the Internet, which I will develop in the following chapters of this thesis. The Internet, short for interconnected network, is a global system that links devices worldwide. It is a network of networks in the sense that it links together private, public, academic, business, and government networks. There is a difference in terms between the Internet and the World Wide Web. Woodford (2019) defines the Internet as the global network of interconnected computers, and the World Wide Web as the multimedia library of texts, graphics, and videos that can be accessed over the Internet. Although the terms World Wide Web and Internet are often used interchangeably, it should be noted that the World Wide Web is a service, an application that runs on the Internet infrastructure, among other

applications. The Internet has changed the world as we know it. Traditional communication media (i.e. telephone, radio, television, paper mail, etc.) have been reshaped by the Internet and the services it offers (i.e. email, Internet telephony such as Skype or FaceTime, online video, digital newspapers, etc.). The Internet has also enabled new forms of personal interactions through instant messaging, Internet forums and social media.

The Internet, as the name suggests (also referred to as the Net for network), tends to be perceived as a virtual space where people can meet and interact. In this sense, the Internet can be seen as a place or a territory shared by virtual communities. Kozinets (2015) posits that the Internet is indeed a territory, and it is based on notions of territoriality. Online social experiences are established through spaces people can own. Just as a site is a location, a website is a virtual location, and most virtual locations have their physical counterparts in real life – for instance, an http code for a company’s website often shares a contact or postal address, a digital poster promotes a physical event, etc. Kozinets (2015, p. 128) thinks that the notions of territoriality are very strong and instinctual within people, and that they are urges around which language and culture have been built:

If we looked around at Internet data, at the various self-organized groupings of information and identity, we can see how the entire Internet has become a series of territories divided by language, by nationality, by traditional religions, regionally, governmentally, economically, financially, by kinship line, and on and on... All of this because we carry our possessive nature with us, online.

Yet, researchers still argue over the nature of the Internet. Bassett and O’Riordan (2002, p. 235) explain that, because the Internet puts in relation human subjects, one can easily make the mistake that the Internet is a type of place or a social space, while, for them, the Internet is actually a text:

The Internet is not only a text-based medium made up of communities, newsgroups and email lists. It is also a medium of publication, and significantly one where users can take control of the means of production, create their own cultural artifacts and intervene in the production of existing ones.

Kozinets (2015) advances that a true definition of the Internet should go beyond the text/communal space debate. While he describes the Internet as both “textlike and spacelike” (p. 139) – qualities which, he says, exist both separately and simultaneously – he thinks that the human dimension of the Internet is what makes it so confusing:

The Internet is not really a place or a text; it is not either public or private; it does not simply contain data but digital doubles of our identities and selves. It is not even one single type of social interaction, but many types: social network status updates, microblogged tweets, posted photos, comments, chats, likes, emails, podcasts, videos, telephone conversations shared using VOIP protocols, and many others. (Kozinets, 2015, p. 139)

The struggle to define the Internet first comes from the fact that it is still a new invention and that people are still learning to deal with it. It also comes from the differences between the two-dimensional aspect of the Internet, in which it is conceived as a text medium, and its three-dimensional characteristic which can generate confusion between virtual life and real life as it is related to the capacity of the human brain to handle virtual realities. Moreover, the issue of individual identity in relation to the expansive use of social media today blurs the line between virtual and real further. From the beginnings of the Internet to the latest Web 2.0 applications, instant messaging (*MSN, Live messenger*), online dating websites (*Meetic, etc.*), blogs, and social media websites (*Facebook, Instagram, LinkedIn, etc.*) have been feeding a cultural model of identity. In everyday “non-digitally-interfaced” life, personal identity does not have a material form other than that of the body (Georges, 2009, p. 167). Researchers (Arfini, Parandera, Gazzaniga, Maggioni and Tacchino, 2021; Smith, Smith and Blazka, 2017; Unal, 2019) agree that the online identity is not simply a matter of a website login or online avatar. It is the sum total of the growing mass of information about us, our profiles and the history of our activities online. It relates to inferences made about us, based on this mass of information, which become new data points. Computers have often been compared to the human brain. Woodford (2019) goes further by asking a subtly different question: “if lots of people are hooked up to one another by a giant worldwide computer network, do they work together in a brain-like way? In short, is the Internet becoming a kind of worldwide brain?” Woodford (2019) tends to define the Internet as a vast entity which seemingly have a life of its own, springing from the lives of the millions of human minds connecting to it. Other researchers (Chorost, 2011; Lanier, 2010) agree that the Internet mirror their users. Nothing would happen online were it not for the person clicking the mouse. The interconnection of human minds that takes place over the Net has been called the ‘hive mind’ by Lanier (2010) – a popular term for the kind of online aggregated, anonymous actions and reactions. It also depicts the fact that a group of people can come to the same thought at the same time while not knowing each other. Likewise, Chorost (2011) calls it the ‘World Wide Mind’, concluding that the Internet is a reflection of a global mind, or a global brain.

Why the United States and Australia

North America and Australia were chosen as sites of study because they share the characteristics of having industrialised, urban areas and wilderness areas. Contrary to Europe, which has been civilised and built for longer, North America and Australia are some of the last countries in the Western world with areas of nature that have not been altered by modern human infrastructures (Watson et al., 2018). They have a long history of nature conservation and extended academic writing on the human-nature relationships as the literature review shows. They come from European settlements and share their territories with indigenous populations. These geographical and historical qualities make nature an

Connecting to nature in the digital age

important part of their cultural identities. From a cultural viewpoint, Australia and the US appear similar on the basis of their Western culture. Indeed, Hofstede's (2001) scales (and his 6-D Model) provide an overview of the deep drivers of Australian culture and American culture, and it shows their similarities on the following criteria: power distance, individualism, masculinity, uncertainty avoidance, long-term orientation and indulgence.

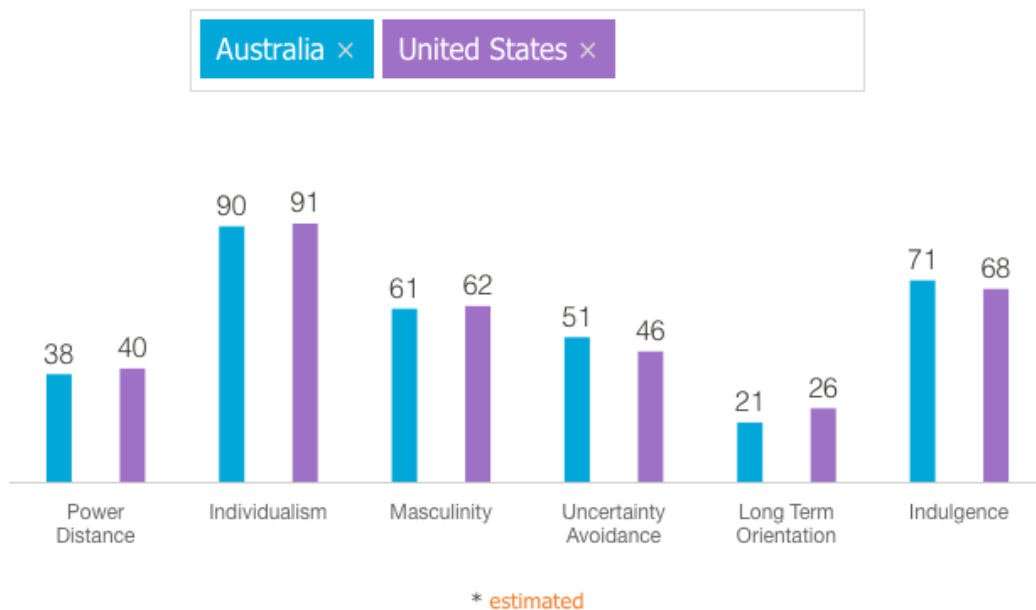


Figure 1.

The six dimensions of national culture for Australia and the United States (Hofstede, 2001)

According to Hofstede's model, power distance is defined as the extent to which the less powerful members of institutions and organisations within a country expect and accept that power is distributed unequally. For instance, both in Australia and in the US, hierarchy within organisations is established for convenience, superiors are always accessible and managers rely on individual employees and teams for their expertise (power is equally distributed). Both countries are predominantly individualistic (meaning self-image is defined in terms of 'I' instead of 'We'), and masculine (i.e. driven by masculine values such as competition, achievement and success, instead of feminine values such as caring for others and quality of life). The dimension of uncertainty avoidance (i.e. the way that a society deals with the fact that the future can never be known and anxiety towards the future) shows a fair degree of acceptance for new ideas, innovative products and a willingness to try something new or different for

both countries. The long-term orientation (i.e. how every society has to maintain some links with its own past while dealing with the challenges of the present and future) shows that both cultures are normative and prefer to maintain time-honoured traditions and norms while viewing societal change with suspicion. Finally, both Australia and the US are indulgent countries (indulgence is the extent to which people try to control their desires and impulses). They exhibit a willingness to realise their impulses with regard to enjoying life and having fun and have a tendency towards optimism.

The potential research limitation of comparing similar cultures was mitigated by the choice of a mixed methodology. Australian or American participants did share commonalities, but the quantitative methodology (via the online survey) helped emphasise each culture's distinctness. Indeed, researchers (Chanda, 1995; Zhang and Lowry, 2008) stress the importance of quantitative methods in cross-cultural research to identify differences between similar cultures. Thus, one of the aims of my study was to dig deeper in each country's culture and go beyond their shared characteristics to identify differences. As I will detail in chapter 3, the cross-cultural mixed methodology, and especially the quantitative approach, was designed to identify these differences.

1.2. Aims and objectives

The research aim of this thesis is to explore how American and Australian participants demonstrating pro-environmental behaviours (PEBs) and being digital technology users view, define and relate to nature. To achieve this aim, I focused on analysing people's beliefs and ideas about nature, and about their sense of self in relation to it, by questioning the concepts inherent to Western culture about nature (i.e. wilderness, human/nature dualism, solastalgia, etc.). The discussion in the literature review revealed that there is an adequate number of studies that describe the relationships between humans and nature in a Western context. However, the large majority of these studies do not evaluate these relationships in a digital context. They do not study the extent to which people's beliefs and ideas on nature can be influenced by digital usage. Additionally, despite the advantages of these studies' approaches, none of them has considered comparing the United States and Australia. This literature gap is further strengthened by the fact that usage behaviour of digital technology is still in a state of constant change (Madden and Fox, 2006). It seems therefore that there is need for an evaluation of the human/nature dualism and Western nature-related concepts in the digital age to provide input on its current state and impact on humans' connection to nature. Following the identification of the research aim, I have formulated the following research objectives:

- (1) To explore the evolution of Western concepts about nature in the 21st Century.
- (2) To analyse the need/relevance for the concept of human/nature dualism in Western culture.
- (3) To provide a deeper understanding of the place of human beings within nature.
- (4) To reveal the impacts of digital technology on human-nature relations.

To achieve these objectives, I defined the following research questions:

- (1) Is the human/nature dualism prevalent in pro-environmental groups/individuals? Has it evolved?
- (2) How is human identity defined in regard to nature?
- (3) Why do we separate from nature?
- (4) To what extent does digital technology impact human relation to nature?
- (5) Do PEBs differ depending on their national cultural origins?
- (6) Can a cross-cultural comparative analysis of PEBs benefit current discourses on environmental sustainability?

1.3. Methodological approach

A sequential explanatory mixed methods research was chosen for this cross-cultural study. It consisted of a quantitative/qualitative phase followed by a qualitative phase. In the first phase, data was collected via a cross-sectional online survey. The survey questionnaire was developed following an extensive systematic review of the literature on the human-nature ties in the contemporary era combining environmental and nature writing, anthropological, sociological and philosophical essays on human-nature relationships. In the second, qualitative phase, the data was collected via in-depth interviews. The purpose of the second phase was to explain and extend the results of the first phase. The main purpose of this research was to investigate the extent and limits of human/nature dualistic ideas in American and Australian pro-environmental digital users, and to see how digital technology interacted with these beliefs. I deemed the mixed methods design to be the most adapted design in the context of a cross-cultural study (Schrauf, 2018). The cumulation of both a quantitative approach and a qualitative approach replicated almost simultaneously on the two countries provided a deeper understanding of the cultural constructs investigated and prevented bias. I will further argue throughout this thesis how this study is of interest and contributes to research in a meaningful way.

1.4. Structure of the thesis

The thesis is compiled of nine chapters. Chapter one is the introduction. Chapter two provides a review of the contemporary sociological, philosophical and environmental literature on nature. I start the literature review by analysing prevalent cultural concepts such as wilderness and the human/nature dualism. I then discuss the environmental movement, the stereotypes it conveys on nature, and how environmentalism inscribed itself in the capitalist structure. In the last part of the literature review, I present the human-nature relation in a digital context, describing modern lack of nature in the context of a mind/body separation. I conclude on the importance of reconnecting to the physical senses to heal our cultural, dichotomous views on nature. Chapter three outlines the research methodology underpinning this study. I start with a presentation of the cross-cultural mixed methods

design. I then describe the data collection and the analysis methods used for the quantitative and qualitative strands are then described before discussing the integration of the methods. In the next part, validity and reliability of findings are presented, as well as a discussion on ethical considerations. Chapter four presents the findings from the quantitative strand of the study. I use descriptive statistics to summarise and describe the data resulting from the online survey. I start by presenting the demographic characteristics of the survey participants, I then discuss their beliefs on nature and conclude with their Internet usage, habits and digital beliefs in relation to nature. Chapter five presents the findings from the qualitative strand of the study. The qualitative data was collected via the online survey and via the interviews. The qualitative findings are organised in themes that emerged from the qualitative analysis in accordance with the thematic analysis method Braun and Clarke, 2006). I reference five themes: connectedness to nature, nature as other, environmental education, ecological emotions, and digital mindfulness. Chapters six, seven and eight integrate the results from the quantitative and qualitative strands and present a discussion of the integrated findings. Chapter six is the first part of the discussion and is dedicated to the concept of nature. In this chapter, I explain that nature can be defined as a process of relationships and interactions between all forms of life including humans, and that in the humanature relation, nature is understood via three distinct dimensions: cognitive (i.e. what phenomena in the real world is considered nature), normative (people's ethical views on nature), and expressive (how nature is experienced aesthetically and emotionally) (Keulartz, Van der Windt and Swart, 2004). Chapter seven, the second part of the discussion, focuses on the concept of culture. In this chapter, I explain that culture and nature cannot be understood as separate entities. I argue that modern Western civilisation is undergoing a shift in worldviews leading to a global pro-environmental culture, and that nature (via both real life and digital nature exposure) is a powerful influence on human culture because it is reshaping human identity. The last part of the discussion, chapter 8, is dedicated to the concept of digital technology. In this chapter, I detail the characteristics of a digital society (i.e. connected individualism, transpatisation and cognification), and I explain how digital technology has impacted the human-nature bond both in positive and negative ways. I argue that digital technology has changed human perceptions of space and time, and thus is redefining human connection to nature. I develop on the notion of digital solastalgia as a negative side-effect of connectivity, and posit that nature exposure can help foster healthy digital habits. Each part of the discussion concludes on the similarities and differences between the American and Australian groups. Finally, chapter 9, the conclusion, draws together the findings from both the quantitative and the qualitative phase and the theoretical framework outlined earlier in the thesis to present a conclusion. It concludes with a summary of the major contributions of the study before outlining the methodological limitations of the research and proposing directions for future research.

2. Literature review

Humankind, apparent master of all things, except itself.

(Oelschlaeger, 1991, p. 327)

2.1. Introduction

This chapter provides an overview of the literature concerning the human-nature relationship in Western culture. We are living in an age where nature and wilderness are defined through the terms of ecology, biodiversity, environmental ethics, climate change, recycling, renewables, and global warming. Environmentalism in the 21st century is about a concept, the received wilderness idea, the notion of wilderness inherited from our forebears. The nature-deficit disorder – a term Richard Louv coined in *Last Child in the Woods* (2005) – has become a defining characteristic of Western societies. The disorder refers to the behavioral problems resulting from not spending enough time in nature. Its direct impact on our physical, mental, and societal health will be the basis for my thesis.

In this literature review, I analyse what we mean by the terms ‘wilderness’ and ‘nature’ and their relations to human beings. Drawing on anthropological and cultural theory literature, I examine what we culturally and linguistically mean by the human/nature dualism that frames our understanding. I also explore the Western ideas of wilderness as a myth that may be debunked as Plumwood (1998), Milton (1996), Cronon (1995) and Callicott and Nelson (1998) propose, and discuss nature-deficit disorder and the forms it takes. The review also considers what Plumwood (2002) alludes to and Rose (1996) terms ‘denarrativisation’, whereby Western culture no longer looks at the world as having its own story and starts to look at the world as a storyless object. The task for this literature review is to explore the following questions: what are the particular ways of understanding nature in Western culture? How do humans relate to and connect with nature? How has nature become a part of Western culture and of Western discourses on nature protection?

I start with a discussion on the Western myth of wilderness, a myth built upon the binary position of a human/nature dualism and reinforced by a romanticised view of wilderness that this binary conveys through the use of language. Then, I focus on the contemporary environmental movement, its birth and its potential limits in a capitalist context. To understand the binary position found in the human/nature dualism, it is also important to examine the particular role it plays for women under the banner of ecofeminism. In the last part, I talk about nature-deficit disorder, as a symptom of a deeper societal identity crisis that is taking place in the digital age, and that tries to solve itself away from the mind process, toward bodily sensations, and, most of all, beyond the human/nature dualism. All of these factors follow the axiom that human beings, unlike other living species, live not in nature but in their relation to nature. As Harrison (1995, p.

427) puts it, “To the extent that we relate to it, we are outside nature. To the extent that we intend things, we do not share the nature of things. But human beings tend to confuse themselves with what they intend”. Our evolution from the human/nature dualism to a humanature relationship – a neologism used by Dickinson (2013) – is the main focus of this literature review. As a note, I wish to add that this thesis is focused on a Western understanding of the human-nature link. I intentionally chose not to focus on the Indigenous approach to nature. And in this literature review, I do not discuss contemporary themes such as ‘Ingeneity’ and the ‘Black Lives Matter’ movement. Likewise, the ‘Me Too’ movement was not relevant to my subject as I include ecofeminist theories and only theories which are tied to environmentalism.

2.2. Faking nature: The Western myth of wilderness

My conjecture, however preposterous this might seem to the modern mind, is that the theoretical spectrum before us – from resourcism through deep ecology and ecofeminism – remains entangled with that cultural project that is the West. (Oelschlaeger, 1991, p. 317)

2.2.1. The romanticised idea of wilderness

Many academics (Aplet, Thomson and Wilbert, 2000; Callicott and Nelson, 1998; Cronon, 1995; Oelshlaeger, 1991) argue that the Western idea of wilderness is a romanticised view of nature. Nash (1967, p. 44) states that the romantic idea of wilderness began in cities, where artists and gentlemen experienced nostalgic remembrances of other times and places. Wilderness appeals to those bored with man and his works. As Olson (1998, p. 100) writes, “men have found at last that there is a penalty for too much comfort and ease, a penalty of lassitude and inertia and the frustrated feeling that goes with unreality”. Cronon (1995, p. 80) adds that nature is seen as a place of freedom and authenticity “in which we can recover the true selves we have lost to the corrupting influences of our artificial lives”. It offers an escape from society, from “the perplexing problems of everyday life and freedom from the tyranny of wires, bells, schedules and pressing responsibility” (Olson, 1998, p. 100). It is also an ideal stage for the romantic individual to exercise the cult that he makes of his own soul. The solitude and total freedom of wilderness creates a perfect setting for either melancholy or exultation as Oelschlaeger (1991) points out. Compared to the urban landscape, wilderness is the ultimate landscape of authenticity “because it is the place where we can see the world as it really is, and so know ourselves as we really are – or ought to be” (Cronon, 1995, p. 80).

The idea of wilderness is linked to the mythology of hunters-gatherers (Kaczynski, 2008; McQuinn, 2009; Oelschlaeger, 1991). The hunters-gatherers were nomadic communities who

relied on foraging for food, in contrast to agricultural societies who rely mainly on domesticated species. According to Oelschlaeger (1991, p. 14), paleolithic people lived comfortably in the wilderness and they probably had enough food to thrive. He argues that no evidence is known of widespread malnutrition or death by starvation: "Paleolithic people were not constantly living on the margin of survival. Poverty, as numerous inquiries make clear, is a condition of civilization". Influenced by environmental writings (Leopold, 1925; Muir, 1911; Nearing and Nearing, 1970; Thoreau, 1854) advocating simple living and self-sufficiency in resistance to the industrial civilisation, many environmentalists think that the shift from hunter-gatherer to agricultural subsistence gave rise to social stratification, coercion, alienation and population growth (Milton, 1996). For Oelschlaeger (1991, p. 14), there was no separation between Paleolithic people and their environment and they experienced an authentic relationship with nature:

Home was where they were and where they had always been. They could not become lost in the wilderness, since it did not exist. The conjecture that the conscious life of Paleolithic people was devoid of such ideas as 'being away from home' or 'in the wilderness away from the inhabited regions of earth' is thus plausible.

A small trend of researchers (Kaczynski, 2008; Olson, 2012) describes themselves as primitivists and criticise agricultural and industrial civilisations. Primitivism advocates a return to a wilder state, an undoing of the domestication of people that has been called 'rewilding' by Olson (2012). But this movement also generates a biased, unidimensional view of nature and indigenous people. Landstreicher (2005) and McQuinn (2009) both criticise the romanticised exaggerations made about indigenous communities and the pseudoscientific appeal to nature perceived in primitivism. Kaczynski (2008) similarly criticises primitivism for portraying pre-civilised hunter-gatherers as innocent and pacifist:

It seems obvious, for example, that the politically correct portrayal of hunter-gatherers is motivated in part by an impulse to construct an image of pure and innocent world existing at the dawn of time, analogous to the garden of Eden.

This view of a prelapsarian time may sound utopian, but it is a generally accepted paradigm that authors such as Kelly (2013) and Bettinger (2015) among many others convey. Zerzan (2008) explains that this has been the mainstream view presented in anthropology and archeology textbooks for the past few decades. However social anthropologist Douglas P. Fry (2013, p. 171) sees today's existing tribal societies as post-civilised, influenced by global civilisation, "irrevocably impacted by history and modern colonial nation states". According to Milton (1996, p. 134), people tend to believe that non-industrial cultures are environmentally benign and this characteristic is a drawback in the radical environmentalist discourse:

The idea that non-industrial cultures are kind to the environment gives a reason for radical environmentalists to see industrialism as responsible for environmental destruction. It also enables them to believe that there are viable alternatives to a destructive economy, that

without industrialism there might be a sustainable way of living. Another point for the persistence of this myth is that environmentalists remain largely ignorant about the ways in which non-industrial peoples understand and interact with their environments.

In short, as Schneidau (1976, p. 39) puts it, “the Western world uses up myth at a tremendous rate”, and it often has to borrow from other cultures. The resulting cultural screen helps people avoid reality as Cronon (1995, p. 81) explains:

To the extent that we live in an urban-industrial civilization but at the same time pretend to ourselves that our real home is in the wilderness, to just that extent we give ourselves permission to evade responsibility for the lives we actually lead.

2.2.2. The human/nature dualism

Scholars (Callicott and Nelson, 1998; Cronon, 1995; Oelschlaeger, 1991, Plumwood, 1998) agree that nature, as well as wilderness, are Western constructs rooted in a human/nature dualism. The Wilderness Act (Section 2c), established by the American Congress in 1964, recognises wilderness as:

An area where the earth and its community of life are untrammelled by man, where man himself is a visitor who does not remain.... An area of undeveloped Federal land retaining its primeval character and influence without permanent improvements or human habitation, which is protected and managed so as to preserve its natural conditions.

The Wilderness Act reflects the conventional idea of wilderness in which nature and human are conceptualised as separate and distinct. Today, the concept of a socially constructed human/nature dualism, or separation of culture and nature, is being increasingly challenged. Cronon (1995, pp. 80-1) writes that “if we allow ourselves to believe that nature, to be true, must also be wild, then our very presence in nature represents its fall. The place where we are is the place where nature is not”. Nature is understood within a narrative of decline from a pristine nature, followed by a need to return to it (Merchant, 2003; Plumwood, 1998). Cronon (1995, p. 80) argues that the wilderness is perceived as “the natural, unfallen antithesis of an unnatural civilization that has lost its soul”. He agrees that the ideal of wilderness is entangled in a reiterative scheme of fall-recovery, inspired by the garden of Eden ideal, in which people dream to return to a nature that is actually human-constructed.

While the term ‘nature’ is more of an all-encompassing term, the term ‘wilderness’ deeply bears the human/nature dichotomy. As Nash (1967, p. 333) argues, wilderness is “a matter of perception, part of the geography of the mind”. Vogel (1988, p. 326) remarks that areas of preserved wilderness such as national parks are highly artificial: “A piece of nature that has been

withdrawn from the natural order in which human transformative activity plays such a crucial part”. He observes that such wilderness is the result of social decision-making. The recent field of ecolinguistics, which emerged in the 1990s as a new paradigm of linguistic research, takes into account not only the social context in which language is embedded, but also the ecological context. As ecolinguists demonstrate, the words we use play an important role in our perception of reality (Abram, 1997; Muhlhausler, 2003; Verhagen, 2008). There is a current debate over whether to use the expressions ‘human/nature dualism’, ‘human-nature dualism’ or even ‘humanature’ (Dickinson, 2013; Haraway, 2003; Milstein, 2011). Scholars question the writing itself and some of them prefer to talk about ‘humanature relationship’ in a conscious linguistic attempt to reunite nature and human. They use compound terms – ecoculture and humanature – to linguistically and mentally connect human and nature, and culture and ecology. Albrecht (2005) created the term ‘solastalgia’ – a neologism formed by the combination of the Latin word *solacium* (comfort) and the Greek root *algia* (pain, suffering) – to describe a form of emotional or existential distress caused by environmental change. Albrecht agrees that some words and concepts are missing in modern language to express a positive and healthy emotional relationship with nature. In *Earth emotions: New words for a new world* (2019), he describes such concepts as ‘euterria’ (a good Earth feeling) or ‘terraliben’ (let the Earth live) as part of the ‘Symbiocene’ (a proposed name for the successor era to the Anthropocene – see point 2.3.3) in which humans are reintegrated as part of the rest of nature and experience a human-nature connection based on positive emotions.

Of all the different spellings, ‘human/nature’ remains the most used when describing human and nature as opposite. ‘Human-nature’ is widespread when scholars acknowledge the dualism but criticise it by stating a link between the two concepts (the hyphen being a symbol of this link). And humanature is a new approach shared only by few academics to describe nature and human as complementary (Dickinson, 2013; Haraway, 2003; Milstein, 2011). Haraway (2003) uses the term ‘naturecultures’ to encompass interrelated historical and contemporary entities. Dickinson (2013) argues that these symbolic textual moves are essential because they represent turns away from the Western myth of wilderness. They are attempts to bypass frameworks in scholarship that can reproduce the very human-nature (and ecology-culture) binaries that studies attempt to critique. I will use these terms knowingly, acknowledging their different meanings, going from the most separated (‘human/nature’) to the least (‘humanature’) depending on the context.

2.2.3. The role of language

Many authors share the following assumption: to be human is to be linguistically and historically enframed (Heidegger, 1969; Oelschlaeger, 1991; Passmore, 1974; Ricoeur 1969). Heidegger (1969) explains that humankind is language and that it suffers from the illusion that it masters and possesses language. Passmore (1974) observes that all ideas are linguistically and culturally enframed. Schneidau (1976, p. 58) agrees that no human thinking is entirely natural and that the thinking mind, which expresses itself in language is a barrier to experiencing nature: “As soon as humans are aware of themselves in societies, they have already separated from nature”. Words are historical and meanings depend on what came before. According to Heidegger (1969, p. 41), “whatever and however we may try to think, we think within the sphere of tradition”. The received wilderness idea is reinforced by the language we use. Oelschlaeger (1991, p. 318) argues that modern language – more precisely its philosophic and scientific literature – is part of a culture that obscures nature: “It seems impossible to understand any alternative, for that would entail abandoning the cultural project on which we have been so long embarked: the modern mind inescapably enframed in language and history”.

Philosopher Edmund Burke (1958, p. 173) observes that words are powerful because they “have an opportunity of making a deep impression and taking root in the mind”. Words shape the way that we see the world. As Albrecht (2020) points out, “the expansion of my language means the expansion of my world”. He further argues that:

The past and current language we are using to understand ourselves in relationship to the Earth is sadly often redundant, confused and mistaken. It separates and alienates us from nature... no better illustrated than with the concept of the ‘environment’. The ‘environment’ implies something that surrounds us. It is a root cause of human alienation from life which knows no boundaries. The ‘environment’ has been appropriated by forces that continue the ecocide of this planet, including by those calling themselves ‘environmentalists’.

If our idea of nature is intrinsically linked to language, some scholars declare that language is intrinsically linked to the notion of myth. Myth reflects the lingering reverberations of the mysterious origins of speech and language (Oelschlaeger, 1991). For Merchant (1995), “nature, wilderness, and civilization are socially constructed concepts that change over time and serve as stage settings in the progressive narrative” (p. 153). Mythic beliefs are common to all people in all places at all times, representing the human attempt to struggle with ultimate mysteries in a narrative form. Oelschlaeger (1991, p. 9) further adds that “Modernism itself is a fictive ‘mythic’ and, like all myths, is tied with language”.

This shift towards an increasingly symbolic culture is highly problematic in the sense that it separates us from direct interaction with the natural world (Dickinson, 2013; Lance, 2004, Milton, 2002). As Milton (2002) points out in *Loving Nature*, we rely primarily on symbolic thought at the expense, and even exclusion, of other sensual and unmediated means of

comprehension. The emphasis on the symbolic is a departure from direct experience into mediated experience in the form of language, art, number, time, etc. Some primitivists state that symbolic culture filters our entire perception through formal and informal symbols and separates us from direct contact with reality (Olson, 2012; Zerzan, 2008). It goes beyond just giving things names, and extends to having an indirect relationship with a distorted image of the world that has passed through the lens of representation. The symbolic mode of expression and understanding is limited and deceptive, and over-dependence upon it leads to objectification and alienation (Plumwood, 2002). Some researchers promote getting back in touch with methods of interaction, such as touch and smell, as well as experimenting with and developing unique and personal modes of comprehension and expression in a natural context (Dickinson, 2013; Milton, 2002).

However, Lance (2004) depicts the tendency to extend the critique of symbolic culture to language itself as “literally insane, for proper communication is necessary to create within the box a means to destroy the box”. More fundamentally, the question is the relation of thinking to reality. Oelschlaeger (1991, p. 350) wonders if we are ready to think that we are nature watching nature, and as he says, “yet if nature is simply a fabrication of the knowing mind, then we are just watching ourselves”. Perhaps we can believe with Kohak (1984, p. 103) that “it is as dwellers in time that humans find their place in nature; it is as bearers of eternity that they find their justification”. But reality cannot in principle equate whatever human beings merely think it is. As Passmore (1974) explains, humans cannot escape having a human perspective on wilderness, whether this be resourcism, preservationism, or ecocentrism.

2.2.4. Debunking the Western myth of wilderness

In the logic of the American Wilderness Act, only Antarctica would qualify as a wilderness area of continental proportion. America and Australia would not, these areas having been inhabited by indigenous peoples for, respectively, more than 11,000 years and more than 40,000 years. Academics (Bayet, 1998; Cronon, 1995; Harrison, 1995; Johns, 1998; Plumwood, 1998) are working at debunking the Western myth of wilderness. Passmore (1974) argues that apart from human experience there is no idea of wilderness, and therefore ecocentrism is a flawed position since humankind cannot view the environment from other than a human perspective. In the same way, Rolston (1989, p. 33) posits that “the advice to follow nature is impossible. We could not do so if we tried, for in deliberately trying to do so we act unnaturally”. For Oelschlaeger (1991, p. 284), the split between nature and culture is inherent to human societies:

All species, except one, live in a naturally determined relationship with their environment, subject to change only through the workings of evolutionary process. The human animal in distinction from all others, interposes culture between itself and environment, which is to say that *Homo sapiens* is a culture-dwelling animal.

The Western myth of wilderness, by emphasising the human/nature dualism, can make people insensitive to the nature around them. Urban areas of nature such as city parks can be deemed inferior to the wild nature. This opposition also questions our notion of 'home'. The idea of 'being lost in the wilderness' requires a geographical referent (home) which is distinct from natural places. Consequently, home is never where nature is and this logic affects ecological actions. Plumwood (1998, p. 671) writes that:

If nature is normally 'somewhere else,' we do not have to be sensitive to its operations in our local environments of urban, working, and domestic life. Of course, as a wilderness lover, I am not advocating that the disrespect extended to ordinary land should be extended to virgin land, but rather the opposite, that the respect presently confined to virgin land should be extended to nature in all our contexts of life.

Oelschlaeger (1991, p. 296) puts it very well: "If humankind is part of nature, then human actions cannot be conceived as anything other than natural even if detrimental to the larger natural community". Schama (1996) and Spirn (2000) argue that we often forget that all landscapes are constructed. Garden, forest, city, and wilderness are shaped by rivers and rain, plants and animals, human hands and human minds. They are phenomena of nature and products of culture. According to Spirn (2000, p. 113), "There is always a tension in landscape between the reality and autonomy of the nonhuman and its cultural construction, between the human impulse to wonder at the wild and the compulsion to use, manage, and control".

Humans have created a conceptual scale for nature, categorising it from the less natural to the wilder (Aplet, Thomson and Wilbert, 2000). But wilderness is nature, or, as Leopold (1925) puts it, wilderness is a relative condition. He explains that wilderness should not be defined as a rigid entity of unchanging content, at the exclusion of other forms of nature. The definition must be flexible. For Callicott and Nelson (1998, p. 20), nature and culture can be united as the yin and yang: "They are opposites, yet not opposed. They are two, yet together form one whole, neither complete without the other. Nature and culture – like male and female or self and other – are, in a word, complementary". White (1995, p. 173) aims to redefine the boundary between human and nature while emphasising the tension between the two.

Most Americans celebrate nature as the world of original things. And nature may indeed be the world we have not made – the world of plants, animals, trees, and mountains – but the boundaries between this world of nature and the world of artifice, the world of things we have made, are no longer very clear.

The growing academic tendency to question human relationship with nature and the conceptual dualisms involved comes from the reality that we are starting to see the prison we have created for ourselves. We need out of this paradoxical situation that takes us to nature, making us "seek the purity of our absence, [while] everywhere we find our own fingerprints" (White, 1995, p. 173).

2.3. Environmentalism and the machine

2.3.1. *The age of ecology: Birth of the environmental movement and the National Park ideal*

The 1960s were a defining decade for the literature on nature and wilderness. In 1962, Murray Bookchin warned about the dangers of pesticides in *Our Synthetic Environment*. That same year, *Silent Spring*, by Rachel Carson, documented the detrimental effects of synthetic pesticides (especially DDT, a colorless, tasteless, odorless insecticide synthesised in 1874) for agricultural uses. And, in 1968, Ehrlich advocated immediate action to limit population growth in *The Population Bomb*. These books mark the beginning of a contemporary environmental movement in the United States that would go on to influence a global environmental movement. In Australia, the environmental movement was the first in the world to become a political movement. Australia was home to the world's first Green party – the United Tasmanian Group (1972). The Australian environmental movement, heavily influenced by the American movement and its environmental literature, later developed its own literature with authors such as Bob Brown (*Wild Rivers*, 1983) and Tim Flannery (*The Future Eaters*, 1994).

The environmental movement and its philosophy are derived from the conservation movement – a political, environmental and social movement that seeks to protect natural resources. Environmental conservation, which is a predominant trend in the United States and in Australia, involves conserving the natural aspect of the environment through reforestation, recycling and pollution control. The environmental movement gave rise to sub-movements, such as the *Bright Green* environmental movement which emphasises the idea that through technology, clever design and a thoughtful use of energy and resources, people can live sustainable lives while enjoying prosperity. In Australia, the anti-litter movement became popular through the actions of *Keep Australia Beautiful*, a not-for-profit environmental conservation organisation born in Melbourne in 1969, and its 'Do the Right Thing' campaign against littering. The contemporary environmental movement, and its sub-movements, are under the influence of the legal definition of wilderness as written in the Wilderness Act of 1964. According to Lowenthal (1964), the tendency to define a landscape as being either natural, in which case it is ideally untrammelled virgin wilderness, or cultural is typically American. As he puts it, "It is no accident that God's own wilderness and His junkyard are in the same country" (Lowenthal, 1964, p. 40). Lowenthal is referring to the American tendency to dichotomise landscapes into natural and wild ones, which are strictly protected against human development, and human ones, which tend to be poorly protected and regulated. From the first American national park created in 1872 (the Yellowstone Park) to the 450 natural areas that are protected today, no nation in the world has contributed more

to the intellectual and social framework of the national park idea than the United States. Many authors have called national parks an American idea. Nash (1967) and Runte (2010) agree that this idea comes from the United States of the 19th century and has become a real asset for the country: “It is said that the national parks are our best idea – that their idealism defines America. Surely, just having parks elevated conservation above simple common sense. Once Americans believed in saving beauty, the land itself became inspirational” (Runte, 2010, p. 1). Moreover, Harmon (1987) points out that national parks are a phenomenon of affluent culture. The Americans and the Australians each possess vast, beautiful, and sparsely populated continents and are also able to draw upon the natural resources of large portions of the globe by virtue of their economic and political dominance. They can simultaneously enjoy the material benefits of an expanding economy and the aesthetic benefits of unspoiled nature. As Guha (1998, p. 239) stresses, “the two poles of wilderness and civilization mutually coexist in an internally coherent whole”.

2.3.2. Sustainability and the machine: The limits of the environmental movement

The conventional connotation of the term ‘ecology’ implies that to look at things ecologically is to see them as connected, as constituting a whole that is greater than the sum of its parts (Merriam-Webster). Yet many environmentalists still depict human and nature as opposed, like there is a battle going on between the two. “World War III,” Andy Kerr of the Oregon Natural Resources Council likes to say, “is the war against the environment. The bad news is, the humans are winning” (as cited in Cronon, 1995, p. 172). Their approach toward nature remains ambivalent and evolving from the human/nature dualism to the humanature viewpoint is a slow process. As Moore (2017, p. 2) points out in *The Capitalocene*, “Holism in philosophy, dualism in practice. This is the generalized condition of green thought today”. However flawed, the wilderness idea has been indispensable to the 20th century nature conservation and environmental movements.

Radical environmentalism, a branch of the larger environmental movement, is being more and more criticised (Bayet, 1998; Guha, 1998; Moore, 2016). The radical environmental movement aims at reconsidering Western ideas of religion, philosophy, capitalism and globalisation in an uncompromising, iconoclastic way (Manes, 1990). As Della Porta (2006, p. 27) mentions, this social movement favours the elaboration and diffusion of beliefs and collective identities. But all radical environmental organisations are not the same. Cianchi (2015) argues that there is a scale in activism tactics. It is helpful to think of organisations such as *Earth First!* and *Sea Shepherd* as being at one end of the continuum of activist tactics. Dave Foreman, co-founder of *Earth First!*, believes in using different tools, from legal organising to civil disobedience and monkeywrenching within a non-hierarchical structure that rejects formal leadership. At the other end are conservative environmental organisations that avoid direct action

and use conventional social and political processes to achieve environmental goals, like the *World Wildlife Fund (WWF)* and the *Australian Conservation Foundation*. In the middle are organisations such as *Greenpeace* and the *Wilderness Society* that have used conventional processes but also direct action.

Deep ecology is an important philosophy for many radical environmentalist groups, though not for all of them. In 1973, Norwegian philosopher Arne Naess introduced the phrase ‘deep ecology’ during a presentation at the Third World Future Research Conference in Bucharest. Deep ecology advocates wilderness and biodiversity preservation, human population control and simple living, or treading lightly on the planet (Naess, 2016). Naess also talks about ‘ecosophy,’ a term he coined for personal life philosophies aiming for ecological harmony. At the heart of the deep ecology philosophy is the notion of ecocentrism, a term used in ecological political philosophy to denote a nature-centred, as opposed to human-centred, system of values. According to Rowe(1994, p. 106):

The ecocentric argument is grounded in the belief that, compared to the undoubted importance of the human part, the whole ecosphere is even more significant and consequential: more inclusive, more complex, more integrated, more creative, more beautiful, more mysterious, and older than time.

But deep ecology, as well as the ecocentric approach, can generate problems when applied in an indiscriminated manner to everyday life issues. Guha (1998, p. 240) explains that “the error which deep ecology in some respects encourages is to equate environmental protection with the protection of wilderness. This is a distinctively American notion, born out of a unique social and environmental history”. Bookchin (1988) charges that deep ecology is becoming one of the most pernicious ideologies to invade the environmental movement in the United States, because it identifies the wrong source of environmental problem (i.e. capitalism), denies the fundamental human rights of human beings, and confuses wilderness with the real world. Guha (1998, p. 277) further adds:

My plea rather is to put wilderness protection (and its radical edge, deep ecology) in its place, to recognize it as a distinctively North Atlantic brand of environmentalism, whose export and expansion must be done with caution, care, and above all, with humility.

Authors such as Bayet (1998) and Plumwood (1998) also denounce the consequences of nature legislation in Australia. If wilderness is supposed to be the place where humans are not, wilderness protection represents a threat to indigenous people who have always been living into the wild. Bayet (1998, p. 318) explains that:

When National Parks were created in order to preserve the wilderness, as written into Australian legislation, Aboriginal people were no longer able to access resources since wilderness was legally defined as land devoid of any human interaction. Consequently, Aboriginal people now perceive National Parks and wilderness legislation as the second

wave of dispossession which denies their customary inherited right to use land for hunting, gathering, building, rituals and birthing rites.

The voice of indigenous people – whether that be Indians in America or Aboriginals in Australia – is barely heard however relevant their approach to nature is. The way Luther Standing Bear (1998, p. 201), a Native American Sioux philosopher describes wilderness could be a humbling lesson for Western societies:

We did not think of the great open plains, the beautiful rolling hills, and winding streams with tangled growth, as ‘wild.’ Only to the white man was nature a ‘wilderness’ and only to him was the land ‘infested’ with ‘wild’ animals and ‘savage’ people. To us it was tame. Plumwood (1998) understands that Aboriginal people strongly reject the pristine concept defined in terms of human/nature dualism. Clashing with their own values and their own culture, this conception of wilderness also symbolises the time when Aboriginal people were denied full humanity for not complying with European culture.

The biophilia hypothesis, introduced by Wilson (1984), is one of the core arguments of the environmental movement. It suggests that humans possess an innate tendency to seek connections with nature and other forms of life (biophilia literally means ‘love of life or living systems’). Albrecht (2019) expands on the humanature connection via his concept of Symbiocene, advocating for a change of the biophysical and emotional foundations of society from the ecocidal to the symbiotic, from the destructive to the nurturing. The scientific meaning of the word ‘symbiosis’ implies living together for mutual benefit. Albrecht (2019) thinks that human action and culture should enhance mutual interdependence and mutual benefit for all living beings and for the health of all ecosystems. Milton (2002, p. 61) also studies how human beings subconsciously seek connections with the natural world, and she adds that the biophilia hypothesis provides environmentalists with a potentially powerful argument:

It suggests that nature, and particularly the presence of other living things, is important for our emotional health, that the destruction of nature deprives us of countless opportunities for emotional fulfilment, that the extinction of other species is, in some ways, the extinction of our own emotional experience.

The hypothesis is used by environmentalists as an argument to justify the protection of wilderness and the legislation behind national parks. But as Guha (1998, p. 240) stresses, protecting the environment does not necessarily mean creating more national parks: “For instance, the German Greens advocate the creation of a ‘no growth’ economy to be achieved by scaling down current unsustainable consumption levels”. In Denmark, the nature preservation movement has largely opposed setting aside nature in enclosed parks. Danes prefer to treat the entire nation as a park (Olwig, 1995). Ultimately, national parks offer a specific commodity and this commodity is the experience of wilderness (Harmon, 1987). And, like Merchant (1995, pp. 155-6) argues, sustainability may be a solution to the ecological crisis but it also reinforces the received

wilderness idea: “Sustainability is a new vision of the recovered garden, one in which humanity will live in a relationship of balance and harmony with the natural world”.

2.3.3. The capitalist spirit and the Anthropocene

Give people enough stuff and they will forget their pain and powerlessness. (Johns, 1998, p. 256)

Naomi Klein, in *This Changes Everything* (2014), describes the climate crisis as a confrontation between capitalism and the planet. Capitalism plays an important role in shaping the wilderness idea (McKibben, 1989; Moore, 2016; Plumwood, 2002). Merchant (1995) thinks that the story of capitalism is a movement from desert back to garden through the transformation of undeveloped nature into a state of order. Like capitalism, today, the notion of Anthropocene is also debated (Crutzen, 2000).

The Anthropocene is a proposed epoch that began when human activities started to have a significant global impact on ecosystems. The term was popularised by Nobel laureate Paul J. Crutzen (2000) to describe how human beings had become a new major geological force transforming the planet by burning coal, oil, and natural gas. As McKibben (1989, p. 58) points out, “We have changed the atmosphere and thus we are changing the weather. By changing the weather, we make every spot on earth man-made and artificial”. Nash (1976, p. 25) mentions that not only the actions of human beings but also their values are changing the environment: “So it is that attitudes and values can shape a nation’s environment just as do bulldozers and chain saws”. The Anthropocene has no agreed start date, but Crutzen (2000) proposes that, based on atmospheric evidence, it started with the Industrial Revolution. Other scientists link the term to earlier events, such as the rise of agriculture. Although it is apparent that the Industrial Revolution ushered in an unprecedented global human impact on the planet, much of the Earth’s landscape had already been profoundly modified by human activities. The concept of the Anthropocene has been the subject of increasing attention and has been criticised as an ideological construct (Malm, 2015; Moore, 2016). Some authors, including Eileen Crist (2013), have called out the anthropocentrism, or more strongly put, narcissism underlying the Anthropocene concept. In a paper published in 2013, Crist argues that by affirming the centrality of man, the Anthropocene shrinks the discursive space for challenging the domination of the biosphere. Moreover, as Albrecht (2012) asserts, the concept of the Anthropocene is based on the underlying assumption that human beings are intrinsically bad and guilty of destroying the Earth, and it fosters negative human-nature relationships:

In the Anthropocene, the so-called new normal – or what I prefer to conceptualize as the new abnormal – life is characterized by uncertainty, unpredictability, genuine chaos, and

relentless change. Planetary distress is manifest in global warming, changing climates, erratic weather, acidifying oceans, disease pandemics, species endangerment and extinction, bioaccumulation of toxins, and the overwhelming physical impact of exponentially expanding human development. Moreover, the Earth's distress has its correlates in human physical and mental distress. Solastalgia, the lived experience of negative environmental change, is one emergent form of mental distress.

Researchers (Milton, 1996; Moore, 2016, 2017, 2018) agree that the concept of Anthropocene is a trap preventing us from finding effective solutions to the environmental crisis. Moore (2017, p. 5) suggests that the term 'Capitalocene' is historically more appropriate:

To locate the origins of the modern world with the steam engine and the coal pit is to prioritize shutting down the steam engines and the coal pits (and their 21st century incarnations.) To locate the origins of the modern world with the rise of capitalist civilization after 1450, with its audacious strategies of global conquest, endless commodification, and relentless rationalization, is to prioritize the transcendence of the relations of power, knowledge, and capital that have made – and are now unmaking – the modern world as we know it. Shut down a coal plant, and you can slow global warming for a day; shut down the relations that made the coal plant, and you can stop it for good.

The capitalist spirit, its endless race to accumulation and the distractions it offers are dominant features of developed societies. But Johns (1990) argues that attempts to substitute possession of things instead of empowerment, sense of place, and authentic relationships are never satisfactory. While some authors (Moore, 2016; Oelschlaeger, 1991) pessimistically agree that the modern project of total humanization of the earth's surface is bound to fail because of the resulting environmental damage, others urge capitalist societies to reconsider the roots of the problem:

If we are concerned about our great appetite for materials, it is plausible to seek to increase the supply, to decrease waste, to make better use of the stocks available, and to develop substitutes. But what of the appetite itself? Surely this is the ultimate source of the problem. (Guha, 1998, p. 242)

Modern solutions to the environmental crisis are at best limited, at worst irrelevant. For Lilienfeld and Rathje (1998), it is obvious that the best way to reduce any environmental impact is not to recycle more, but to produce and dispose of less. As they (as cited in McDonough and Braungart, 2002, p. 50) explain, "Recycling is an aspirin, alleviating a rather large collective hangover...overconsumption". Moore (2017) is afraid that the capitalist spirit blinds us to our relation to nature. He (2017, p. 4) thinks that human activity not only produces biospheric change, but relations between humans are themselves produced by nature: "This nature is not nature-as-resource but rather nature-as-matrix: a nature that operates not only outside and inside our bodies (from global climate to the micro-biome) but also through our bodies, including our embodied

mind”. And as Crist (2013, p. 131) stresses, maybe the most important problem about the Anthropocene concept: “Of equal if not greater significance is what this discourse excludes from our range of vision: the possibility of challenging human rule”.

2.3.4. Ecofeminism: Women and nature

Adam was a rough draft, Eve is a fair copy. (*Feminist slogan*)

Ecofeminism is a term coined by French author Françoise d'Eaubonne in *Le féminisme ou la mort* (1974). The movement emerged in the 1970s as myriad forms of feminist and environmental theories and activism intersected. It reasserted the link between women and nature as something unique, sacred and exclusive. Mary Daly (1978, p. 13) depicts this unique bond between women and nature as follows: “It is about women living, loving, creating our Selves, our cosmos. It is dispossessing our Selves, enspiriting our Selves, hearing the call of the wild, naming our wisdom, spinning and weaving world tapestries of our genesis and demise”. Ecofeminists believe that these connections are illustrated through traditionally ‘feminine’ values such as reciprocity, nurturing and cooperation, which are present both among women and in nature. Women and nature are also united through their shared history of oppression by a patriarchal society (Plumwood, 1993; Warren, 1997). The examples emphasising women’s bond to nature are easy and abundant. For instance, the menstrual cycle, which is linked to lunar cycles, is seen as evidence of women’s closeness to the body and to natural rhythms. The cultural image of the premenstrual woman as irrational and overemotional typifies the association between women, nature and the irrational. During the first wave of ecofeminism (1970s-1980s), the spiritual dimension was significant, probably under the influence of the American counterculture. Authors such as Starhawk and Mary Daly became popular for what was called spiritual ecofeminism. Starhawk (1990) calls it an earth-based spirituality, which recognises that the Earth is alive, and that we are all interconnected. They use the symbols of the witch or the goddess to denounce women’s battle against a male-dominated society. Daly (1978, p. 15) talks about a time when women will be powerful again: “As this happens, Athena will shuck off her robohood, will return to her real Source, to her Self, leaving the demented Male Mother to play impotently with his malfunctioning machine”.

On the other hand, Davies (1988) and other ecofeminists like Merchant (1980, 1995) argue that the women-nature connection is socially created. For Merchant (1995), it is a false precept to think that women have a special knowledge of nature, or special abilities to take care of it. Coming out of the 1990s, ecofeminism met a lot of criticism within its own circle (Plumwood, 1993). The second wave of ecofeminists tried to redefine their core values and modern ecofeminism now focuses on intersectional questions, such as how the nature/culture

dualism enables the oppression of female and nonhuman beings. Modern ecofeminism is also concerned about reproductive technology, equal pay and equal rights, toxic poisoning, or Third World development (Shiva, 1988; Spretnak, 1990).

First-wave ecofeminism, by showing an adherence to a strict dichotomy between men and women, has first widened the gap between nature and human and fed the second-wave of ecofeminists with dissident discourses. Plumwood (1993) criticises the adherence to strict dichotomies, explaining that the dichotomy between men and women and culture and nature creates a dualism that is too stringent and focuses only on differences. She further adds that ecofeminism strongly correlates the social status of women with the social status of nature, rather than expressing the view that women along with men and nature both have masculine and feminine qualities. And, just like feminine qualities are often described as less worthy, nature is also seen as having a lesser value than culture. Second-wave ecofeminists denounce the binaries inherent to Western culture including culture/nature, mind/body, male/female, human/animal, individual/global (Davies, 1988; Merchant, 1980; Plumwood, 1993; Shiva, 1988). Plumwood (1993, p. 11) criticises the gendered character of the nature/culture dualism, and the other dualisms interconnected with it: “It is not a feature of human thought or culture *per se*, and does not relate the universal man to the universal woman; it is specifically a feature of *western* thought”. Ecofeminists claim that associating women with nature and men with culture or reason provides the basis of the cultural elaboration of women’s oppression in a Western context.

It is important to note this point because some ecofeminists have endorsed the association between women and nature without critically examining how the association was produced by exclusion. That women and nature have been thrown into an alliance remains to be analysed according to many authors (Merchant, 1980; Plumwood, 1993; Spretnak, 1990). This analysis would form the basis for a critical ecological feminism in which women consciously position themselves with nature. Shiva (1988, p. xi) argues that ecofeminism should let go of Western preconceived ideas and rules for femininity to stop being a limiting value and to start being “an expanding one – holistic, eclectic, trans-specific and encompassing diverse stirrings”.

Today ecofeminists still struggle against one of the most common forms of denial of women and nature – what Plumwood (1993, p. 21) has termed ‘backgrounding’ - which conceptualises women “as providing the background to a dominant, foreground sphere of recognised achievement or causation”. This backgrounding of women and nature is deeply embedded in the structures of contemporary society. Women are systematically backgrounded and instrumentalised as housewives, nurses, secretaries, colleagues and, especially, as mothers (Pringle, 1988). “Traditionally, women are ‘the environment’- they provide the environment and conditions against which male ‘achievement’ takes place, but what they do is not itself accounted as achievement” (Plumwood, 1993, p. 22). Nature is perceived as the background for many human

wars and conflicts. The status of nature as a background to human lives has even extended to the idea of nature itself. According to Descola and Palsson (1996, p. 98), “The conclusion seems inescapable: suppress the idea of nature and the whole philosophical edifice of Western achievements will crumble”. Ecofeminists also object to a universalised concept of ‘humanity’ used “to deflect political critique and to obscure the fact that the forces directing the destruction of nature and the wealth produced from it are owned and controlled overwhelmingly by an unaccountable, mainly white, mainly male elite” (Plumwood, 1993, pp. 11-2). Today ecofeminism is a multi-faceted movement which challenges structures rather than individuals. It works to deconstruct Western ideologies and redefine nature as well as human beings in general. Yet, it does not mean that the only way out of dualism is oneness, or monism, which represents the return to a lost unity, and evokes a prelapsarian time when humans were at one with nature (Cronon, 1995). Going back to nature to find that lost harmony again is precisely what the concepts of Mother Earth or Gaia convey. These concepts convey the image that this original unity is sacred, and they have been deconstructed by Merchant (1980, 1995, 2003) as being part of the Western mythology around nature.

2.4. Forward to nature: Healing nature-deficit disorder in the digital age

Living in integration with wild nature is not a veiled invitation for humanity to return to its pre-Neolithic phase, nor does it automatically signal (in my view) an *a priori* ceiling to technological innovation; nor is it intended to conjure a naive view of life as an Edenic kingdom. (Crist, 2013, p. 143)

2.4.1. Nature-deficit disorder

‘Nature-deficit disorder’ is a phrase coined by Richard Louv in *Last Child in the Woods* (2005). Although not recognised as a medical condition, this disorder refers to the wide range of behavioural problems resulting from not spending enough time in nature. Louv (2012) describes the modern situation of living in the digital age, which implies dealing with the daily anguish and stress inherent to Western societies, and feeling disconnected from the whole web of life while being overstimulated by socio-technological demands. He offers the following definition of nature-deficit disorder:

By its broadest interpretation, nature-deficit disorder is an atrophied awareness, a diminished ability to find meaning in the life that surrounds us, whatever form it takes. This shrinkage of our lives has a direct impact on our physical, mental, and societal health. However, not only can nature-deficit disorder be reversed, but our lives can be vastly enriched through our relationship with nature, beginning with our senses. (Louv, 2012, p. 11)

For Louv, ubiquity – the condition of being present in many places simultaneously – is one of the new characteristics of modern societies. He (2012, p. 23) denounces a new field called ‘interruption science’ and its consequence, namely continuous partial attention. As he explains, 28% of a worker’s day is taken up by interruptions because of digital technology and constant connectivity. This results in less productivity, less creativity and more stress. In the same way, Gittleman (2011, p. 5) warns about the health consequences and stress induced by electropollution. She explains that the human body, which is 75 percent water, conducts electricity: “We are wired to respond to the electromagnetic forces in the universe, from the fields surrounding far-off celestial bodies to the vibes we pick up from each other to the radio waves from the thousands of cell towers that dot the landscape”. Indeed, as Hyman (2012, p. 237) jokingly points out, “we all live with a little bit of post-traumatic stress syndrome (or we should say, traumatic stress syndrome because for many of us there is nothing ‘post’ about it)”. Increasingly, scientists (Atchley, Strayer and Atchley, 2012; Berman, Jonides and Kaplan, 2008; Williams, 2017) demonstrate that the more high-tech our lives become, the more nature we need to maintain physical and mental health. This is an important point in the digital era. But the notion of nature as healing is not new (Thoreau, 1854; Nearing, 1970). American landscape architect and journalist Frederick Law Olmsted (as cited in Spirn, 1995, p. 93) frequently suffered from nervous ailments and was convinced that the “contemplation of natural scenes of an impressive character” increased the capacity for happiness and that the lack of it could lead to depression and mental illness. Turner (1998, p. 620) adds that it takes a lot of time in nature for the body to go back to its physiological rhythm:

Two weeks is a minimum, a month is better. Until then the mind remains bound to metronomic clocks and ignorant of natural biological rhythms, and the wilderness traveler remains ignorant of forces more fundamental and more calming than the mechanical overlay they have so diligently clamped down on themselves.

The descriptions of the positive effects of natural scenery may sound dated and naive, but recent studies (Byrka, Hartig and Kaiser, 2010; Martin, Pahl, White and May, 2019; Otto and Pensini, 2017; White et al., 2019) have documented the beneficial effects of nature on human health. For instance, hospital patients who have windows with views of trees, or other natural scenery, have been shown to heal faster than patients who have views of buildings or no window at all (Ulrich and Parsons, 1992). While the industrialised work field has transformed the natural landscape, it has simultaneously reduced much of people’s knowledge of nature. White (1995, p. 172) describes what the humanature relation used to be before spending time indoors became more important than spending time outdoors:

Humans have matched their energy against the energy of flowing water and wind. They have known distance as more than an abstraction because of the physical energy they expended moving through space. They have tugged, pulled, carried, and walked, or they

have harnessed the energy of animals, water, and wind to do these things for them. They have achieved a bodily knowledge of the natural world.

Milton (2002) and Plumwood (2002) agree that this absence of a ‘bodily knowledge’ of nature is what is driving our society sick.

2.4.2. The identity crisis: Mind over body

Those realists who insist on reminding us that human beings are nothing but tiny microorganisms on a speck of cosmic dirt called Earth are not wrong in their analogy... Humans are those beings for whom being nothing but tiny microorganisms on a speck of cosmic dirt is a source of anguish. (Harrison, 1995, p. 434)

No modern phenomenon seems more troubling than the emergence of ‘virtual reality’ as a new form of human experience. People now experience ‘environments’ that are completely constructed by computers (Hayles, 1995). Whether playing a computer simulation game, or cruising the Internet, children and adults alike are spending increasing amounts of time in cyberspace. Many authors agree that Western society is currently going through a deep identity crisis in the process of redefining itself and its relationship to a new environment (Crist, 2013; Cronon, 1995; Louy, 2012; Oelschlaeger, 1991). The Anthropocene discourse clings to “the almighty power of that jaded abstraction ‘Man’ and to the promised land his God-posturing might yet deliver him, namely, a planet managed for the production of resources and governed for the containment of risks” (Crist, 2013, p. 139). At the same time, men are being forced to participate in a master identity, and as Crist (2013, p. 139) argues, there will be no escaping from the existential and ethical consequences of that identity. She points out that understanding the cause of the environmental crisis involves questioning our own identity and how humans define themselves in regard to nature. Healing our feeling of disconnection from nature would be a first step to changing the way we act towards the environment. Jonas (2010, p. 24) similarly observes: “The image of man is at stake”. For many years, academics, like Bateson (1972, p. vi), have tried to put this feeling of inconsistency into words in order to relieve themselves and other humans from this pervading malaise:

Sometimes the dissonance between reality and false beliefs reaches a point when it becomes impossible to avoid the awareness that the world no longer makes sense. Only then is it possible for the mind to consider radically different ideas and perceptions.

Revising ideas about the world is the starting point. For Hayles (1995, p. 456), what is needed is a view of humanity that integrates humans into nature in order to stop the separation scheme. It means a view of nature that stresses “its interpenetration into all areas of human experience and cognition, including the artificial worlds of simulation technologies”. Nowadays there is no such image of who we are.

What we have instead are fragments of concepts of how we function – biologically, genetically, socially, psychologically, linguistically, and so on – but even a complete understanding of function, were it possible, would not amount to self-knowledge. (Harrison, 1995, p. 427)

Western individuals are left with a fragmented self, suffering from a separation from nature, an empty shell, disconnected from the whole web of life (Dickinson, 2013; Guha, 1998; Flannery, 1994). Many persons could relate to the feeling of emptiness described by Harrison (1995, p. 435), which, he argues, is a consequence of the human/nature dualism.

I am nature's exception and nature's negation insofar as my self-awareness is aware of nothing – a nothing that separates me, isolates me, individuates me, forcing me into relation, mediation, and intention, call it language.

Researchers (Bateson, 1972; Chopra and Tanzi, 2012; Oelschlaeger, 1991) agree that human mind questions everything in its quest for an identity. As Harrison (1995, p. 427) wonders, "Question: Who are we? Answer: Beings for whom the question is an issue. But if and when the question ceases to be an issue, does the answer still hold?". Thinking too much about nature is deemed a barrier to a healthy relationship with it. As Muir (1911, p. 26) emphasises, while reflecting on poison ivy, the mind may be overused: "Like most other things not apparently useful to man, it has few friends, and the blind question, 'Why was it made?' goes on and on with never a guess that first of all it might have been made for itself".

According to Hayles (1995), virtual worlds can help people deal with the 'unreality' of reality. She states that the positive aspect of virtual worlds is to make clear that humans never perceive nature directly. All perception of the outside world is constructed through interactions between what is 'out there' and the cognitive-sensory apparatus. She (1995, p. 456) goes as far as claiming that virtual worlds are in this sense 'natural'. The world as we experience it, then, is neither completely natural nor completely artificial, and our interactions with nature are always mediated to some degree, whether we experience real nature or virtual nature. Many authors agree that the reality we perceive is biased. The fact that the physical world is not a given has been validated over and over. This is what Bateson (as cited in Milton, 2002, p. 26) explains:

So we all make – my mental processes make for me – this beautiful quilt. Patches of green and brown, black and white as I walk through the woods. But I cannot by introspection investigate that creative process. I know which way I aim my eyes and I am conscious of the product of perception, but I know nothing of the middle process by which the images are formed.

Chopra and Tanzi (2012) work at explaining this process scientifically. When you are gazing at a beautiful landscape – they take the Grand Canyon as an example – science shows that what actually happens is that photons of sunlight make contact with the retina and stream in the brain.

The visual cortex is activated through chemical and electrical activity, which, as the authors say, comes down to electrons bumping into other electrons. Humans live unaware of this process.

Something almost incredible is happening here, because not a single quality of this experience is present in your brain. The Grand Canyon glows a brilliant red, but no matter how hard you search, you won't find a spot of red in your neurons. The same holds true for the other four senses. Feeling the wind in your face, you won't find a breeze in your brain, and its temperature of 98.6 degrees Fahrenheit won't change, whether you are in the Sahara or in the Arctic. Electrons bump into electrons, that's all. (Chopra and Tanzi, 2012, p. 268)

Every aspect of reality is born 'in here' as an experience and, as Bateson (1972, p. vi) stresses, we create the world that we perceive, not because there is no reality outside our heads but because we select and edit the reality we see to conform to our beliefs about what sort of world we live in: "The man who believes that the resources of the world are infinite, for example, or that if something is good for you then the more of it the better, will not be able to see his errors, because he will not look for evidence of them". Chopra and Tanzi (2012) go further and argue that mind and consciousness are two different things. While the mind creates concepts and ideas, the consciousness encompasses all experience, acknowledging human ascendancy over mind is essential: "The mind has always amazed itself. Now it has a chance to fulfill itself" (Chopra and Tanzi, 2012, p. 275). We have to let go of the belief that the physical world is the same for all living things. In reality, the physical we experience only mirrors the human nervous system. Similarly, Tolle (1997, p. 16) asserts that the identification with the mind creates an opaque screen of concepts, words and judgments, that blocks authentic relationships with others and with the environment.

It is this screen of thought that creates the illusion of separateness, the illusion that there is you and a totally separate 'other'. You then forget the essential fact that, underneath the level of physical appearances and separate forms, you are one with all that is. By 'forget,' I mean that you can no longer feel this oneness as self-evident reality.

For Tolle (1997, p. 16), the solution is to let go of false beliefs, however reassuring they might be, and to feel (instead of think) one's way through life: "A belief may be comforting. Only through your own experience, however, does it become liberating".

2.4.3. The silent pulse: From mind back to body and beyond the human/nature dualism

To some extent, redefining our relationship to nature can only pass through reconnecting with the animal within ourselves. This is a strong trend today and it reflects a willingness to let go of the human/nature dualism and develop connection to nature. As Harrison (1995, p. 428) observes:

Precisely at the moment when we have overcome the earth and become unearthly in our modes of dwelling, precisely when we are on the verge of becoming cyborgs, we insist on our kinship with the animal world. We suffer these days from a new form of collective anxiety: species loneliness.

Ingold (1996) adds that the status of humans in a Western context is ambiguous. On the one hand, humankind is an animal species among others, and animality is a domain that includes humans; on the other hand, humanity is a moral condition which excludes animals. Viveiros de Castro (1998, p. 479) confirms this paradox. He thinks that our mind is our great “differentiator” and that it raises us above animals and matter in general. It is what distinguishes cultures. In contrast, the body is the major “integrator”. As de Castro (1998, p. 479) points out, “it connects us to the rest of the living, united by a universal substrate (DNA, carbon chemistry) which, in turn, links up with the ultimate nature of all material bodies”. Indigenous wisdom is one facet offering a bridge between human and nature. Kimmerer (2020) shares how the interactions between humans and the environment are understood through a negative lens in Western culture and Western education. As she explains in a survey she did on students who had selected careers in environmental protection, “they were well schooled in the mechanics of climate change, toxins in the land and water, and the crisis of habitat loss”. When asked to rate their knowledge of positive interactions between people and land, the students’ median response was *none*. Likewise, Australian Aboriginal researcher Yunkaporta (2020) explains how ancient Aboriginal wisdom can apply to science and modern times. He argues that lines, symbols and shapes can help make sense of the world, and shares a way of thinking, of learning to see from a native perspective that is spiritually and physically tied to the earth. Both Kimmerer (2020) and Yunkaporta (2020) contribute to the meanings of wild, wilderness and rewilding and offer positive human-nature connections.

For thousands of years, Western religion and philosophy have taught that humans are set apart from animals and the rest of nature, made, unlike them, in the image of God. But, as Plumwood (2012, p. 14) phrases, “It was heresy to believe that any species other than humans could be saved or go to heaven, a place of sacredness and perfection reserved exclusively for human beings”. She denounces the failure of Western culture to come to terms with the inclusion of human beings in the animal and natural order. She argues that this is a major factor behind the environmental crisis. In *Being prey* (1996, p. 33), Plumwood explains that there is a strong effort in Western culture to deny that humans are also animals positioned in the food chain. Humans see themselves as predators but never prey. She argues that this is one of the reasons why we treat animals inhumanely, having never experienced ourselves as food for other species. In 1985, during a visit to Kakadu National Park, Plumwood survived an attack by a crocodile. She wrote about this life-changing experience in

a posthumously published book, *The eye of the crocodile* (2012). The experience gave her a glimpse of a different world and permanently altered the way she perceives human beings within their environment:

It is not a minor or inessential feature of our human existence that we are food: juicy, nourishing bodies. Yet, as I looked into the eye of the crocodile, I realised that my planning for this journey upriver had given insufficient attention to this important aspect of human life, to my own vulnerability as an edible, animal being. (Plumwood, 2012, p. 10)

This accident helped her see the world ‘from the outside’, from outside the narrative of self, where every sentence can start with an ‘I’. What Plumwood hints at is a process that Rose (1996) terms ‘denarrativisation’, whereby one no longer looks at the world as having its own story and starts to look at the world as a storyless object. Rose, along with Bateson (1972) and Milton (2002), agree that perception is necessary to interact with reality, and ultimately nature, but interpretation is not. Chopra and Tanzi (2012), Milton (2002) and Oelschlaeger (1991) explain that ideas about nature arise in human consciousness, via the mind, and turn into Western culture and discourses about nature. Plumwood (2012, p. 11) also wonders, after the crocodile attack, how she came to make this terrible mistake about her identity, implying a mind/body dichotomy, a form of “disembodied consciousness” dissociated the physical body. In recent years, anthropologists have tended to suggest that our understanding of the world is shaped solely by the culture in which we live. Controversially, many studies (Arnoky, Stroink and DeCicco, 2007; Clayton, 2003; Kunchambo, Lee and Brace-Gova, 2017; Schultz, 2002) emphasise the links between natural environments and human self-identity, and assert – notably via such concepts as environmental identity or connectedness to nature – that human beings are not only part of nature, but are nature itself. Moreover, Milton (2002) argues that worldviews are shaped by direct experience in which emotion plays an essential role. In *Loving nature*, she (2002, p. 59) makes clear that emotions are different from ideas, and adds that “they are learning mechanisms, devices for helping us to discover what the world is like”. Emotions, being somewhat independent from the thinking mind, are more reliable than ideas to authentically approach to the world. The distinction between knowing and representing is also an important one for Milton. Representations are essential components of discourse, humans need to represent things in order to communicate their ideas about them.

When nature protectionists speak of the Earth as ‘mother’, when they describe non-human animals as sentient beings worthy of moral consideration, when they refer to Gaia as a superorganism whose interests might conflict with our own, they are using representations, interpretations constructed in the process of conveying a message. (Milton, 2002, p. 31)

Milton believes that knowledge unbiased by emotion cannot exist, for it is emotion that enables the development and use of knowledge. She (1996, p. 61) asserts that “culture can therefore

be left out of the ecological equation; it does not mediate between human beings and their environment, and therefore need not be taken account of in an analysis of that relationship”.

2.5. Conclusion

The objective of this literature review was to develop a better understanding of how nature is seen in contemporary Western culture and how human beings relate to it. It drew on anthropological and cultural theory literature to examine what we culturally and linguistically mean by the human/nature dualism and explored the Western ideas of wilderness as a myth that, according to some scholars, can be debunked (Plumwood 1998, Cronon 1995, Callicott and Nelson 1998). It also discussed the nature-deficit disorder and its direct impact on our health. In particular, this review has provided an overall understanding of the human-nature dualism in Western discourses on nature protection and the relationship between the Western myth of wilderness and the current ecological crisis. While the main question analysed was the relation of thinking to reality, another predominant point in this review was the growing need for a more sensuous and emotional approach to life, an approach that will enable us to discover a common middle ground in which everything, from the city to wilderness, can somehow be encompassed in the word ‘home.’

However, some areas have not been sufficiently covered by other researchers. How the current identity crisis can be solved by establishing new ways to approach nature through the body is an interesting knowledge gap my PhD thesis intends to fill. Some scholars (Oelschlaeger 1991, Louv 2012, Milton 2002) argue that there is a mirror-effect between the current identity crisis and the ecological crisis and that to address one will benefit the other. Few academics have yet defined concrete and practical solutions to this problem (how to heal the body/how to heal the planet). While Louv (2012) and Dickinson (2013) are proposing strategies, analysing this situation and its impact in a digital context is something few have done. As Louv (2012, p. 11) argues, “not only can the nature-deficit disorder be reversed, but our lives can be vastly enriched through our relationship with nature, beginning with our senses”. In order to do so, we must first become aware that reality is not necessarily as we believe it to be. We have grown estranged in our relation to nature. Are we ready to see human and nature as opposites, yet not opposed, two, yet together forming one whole? Or as Oelschlaeger (1991, p. 350) asks, “Do we dare think that we are nature watching nature?”, so that “if nature is simply a fabrication of the knowing mind, then we are just watching ourselves”.

3. Methodology

Research is, at root, a set of practices.

(Kozinets, 2015, p. 4)

3.1. Introduction

Based on the research aim, research objectives, and research questions, in this chapter, I discuss the methodological decisions and describe the research process in depth. I start with a presentation of the research design, explaining the choice of mixed methods adopted in the study and the cross-cultural comparative research design. I then proceed with details on the data collection process, starting with the cross-sectional online survey (see appendix A for survey questions) combined and supplemented by semi-structured interviews. This is followed by detailed information on the data analysis for the quantitative and the qualitative strands. I conclude the chapter with a discussion on the validity of findings, on ethics and on methodological limitations.

3.2. Research design

3.2.1. Cross-cultural mixed methods research

This study was conducted with a cross-cultural sequential explanatory design model (Schrauf, 2018). The cross-cultural sequential explanatory design involves two components: a mixed methodology via the sequential explanatory design, and a cross-cultural comparative approach. Schrauf (2018) describes cross-cultural mixed methods designs as a special case of the more general mixed methods designs. The defining features of this design combine the characteristics of mixed methods as the integration of qualitative and quantitative approaches, and that of cross-cultural comparison as the collection and analysis of data from two or more cultural settings for the explicit purpose of comparisons (Schrauf, 2018). The methodology was chosen over focus groups due to the peripheral, rather than a centre-stage role of the researcher. The major advantage of focus groups is the opportunity to observe interactions, yet the option was dismissed for the unnatural setting in which they are conducted and the researcher's lack of control over the course of the discussions (Morgan and Spanish, 1984). Interviews were deemed more adapted to explore experiences, beliefs and motivations of individual participants. In interviews, the researcher adopts the role of an 'investigator', asks questions and controls the dynamics of the discussion. In contrast, in a focus group, the researcher adopts the role of a 'moderator' and facilitates the discussion between participants (Bloor, Frankland, Thomas and Robson, 2001; Gill, Stewart, Treasure and Chadwick, 2008). To offer an accurate explanation of the cross-cultural sequential explanatory design, the characteristics of each components

(i.e. mixed methodology and cross-cultural comparative approach) will first be detailed, and arguments will then be provided for the relevance of combining both.

3.2.1.1. Mixed methods characteristics

One of the first major choices to make for any research project is whether to use a quantitative approach, a qualitative approach, or an approach that uses mixed methods. Mixed methods research emerged as a distinct methodology as a result of a growing interest in combining and triangulating different quantitative and qualitative data sources (Teddlie and Tashakkori, 2009). Creswell and Plano Clark (2007) date the beginning of mixed methods research back to the mid- to late 1980s. It involves collecting, analysing and integrating quantitative (e.g., experiments, surveys) and qualitative (e.g., focus groups, interviews) research (Punch, 2014). It includes the collection of both open and closed-ended data in response to research questions (Johnson and Onwuegbuzie, 2004). Creswell and Plano Clark (2007) give the following overview of mixed methods: (1) both qualitative and quantitative data are collected and analysed; (2) both forms of data can be mixed concurrently by combining them, sequentially by having one build on the other, or by embedding one within the other; (3) priority can be given to one or both forms of data; (4) procedures can be used in a single study or in multiple phases of a program of study; (5) procedures need to be framed within a philosophical worldview; and (6) procedures are combined into a specific research design that directs the plan for conducting the study.

Brand (2009) argues that the use of either quantitative or qualitative methods alone might not allow for a proper examination of a chosen subject, and too often, then, the link between results and ‘reality’ is assumed rather than systematically investigated. Ritchie, Lewis, and Elam (2003) explain that the word ‘qualitative’ implies an emphasis on the qualities of entities that are not experimentally measured in terms of quantity, amount, intensity, or frequency. In contrast, quantitative studies emphasise measurement and analysis of causal relationships between variables. The qualitative researcher stresses the socially constructed nature of reality, the intimate relationship between the researcher and what is studied, and the situational constraints that shape inquiry as Denzin and Lincoln (2003) observe. Quantitative researchers, on the other hand, claim that their work is done from within a value-free framework. As Punch (2014) sums it up, quantitative research study numbers and qualitative research study mostly words.

Selected participants for this study demonstrated pro-environmental attitudes, which suggests that they already had a relationship with nature. My aim for this study was to test the evolution of the human/nature dualism today and to go beyond the stereotypes of eco-conscious individual feeling at one with nature. Researchers (Janmaimool and Khajohnmanee, 2019; Milton, 2002) argue that interacting with nature tends to make one more eco-conscious and develop what

Clayton (2003) terms an environmental identity (i.e. an extension of the individual identity to the environment), yet I wanted to see whether one could feel dissociated from nature despite nature exposure. In this respect, a mixed methodology enabled me to estimate the participants' beliefs with the qualitative findings while keeping in sight the big picture and orientation of their beliefs with the quantitative findings. Mixed methods may not provide perfect solutions, but they offer the advantages of heightened knowledge and validity, and achieve multiple validities legitimation by meeting the relevant combination of quantitative and qualitative validities (Johnson and Onwuegbuzie, 2004).

3.2.1.2. Cross-cultural comparative research

Thinking without comparison is unthinkable. And, in the absence of comparison, so is all scientific thought and scientific research. (Swanson, 1971, p. 145)

There is a vast vocabulary to distinguish between the different kinds of comparative research. Cross-country, cross-national, cross-societal, cross-cultural, cross-systemic, cross-institutional, as well as trans-national, trans-societal, trans-cultural, and comparisons on the macro-level, are used as synonymous with comparative research in general. According to Oyen (1990, p. 7), the confusion reflects the fact that “national boundaries are different from ethnic, cultural and social boundaries”. Primarily defined as a cross-national research in the sense that it compares two countries, as the research evolved, this study was then defined as cross-cultural as it focuses on the variations in cultures across the named countries. Ragin (1989) agrees that virtually all empirical social research involves comparison of some sorts. If the aim of cross-national research is to reduce unexplained variances and find patterns and relationships, as Ragin (1989, p. viii) points out, “the problem is not to show which methodology is best but to explore alternative ways of establishing a meaningful dialogue between ideas and evidence”. The challenge comes in trying to make sense of the diversity across cases in a way that unites similarities and differences in a single, coherent framework.

The 21st century has been characterised by a growing internationalisation and the resulting exchanges of social, cultural and economic manifestations across national borders. The advent of the Internet has blurred these boundaries further on the path to globalisation. Oyen (1990, p. 1) thinks that this globalising trend has changed human cognitive map: “While some cultural differences are diminishing, others are becoming more salient. Comparative research may have to shift its emphasis from seeking uniformity among variety to studying the preservation of enclaves of uniqueness among growing homogeneity and uniformity”.

The main problem encountered for the comparative approach of this study concerned the comparability of different countries, in this case the United States and Australia. When can two

countries legitimately be compared? Ragin (1989, p. vii) urges researchers to start by looking at the context of the defined social phenomena and by asking questions about its historical, cultural, or geographical origin:

Instead of trying to determine the different contexts in which a cause influences a certain outcome, some tend to assess a cause's average influence across a variety (preferably a diverse sample) of settings. There is a long tradition in the social sciences of preferring big questions and comparably broad empirical generalisations.

On the other hand, Smelser (1976, pp. 2-3) claims that comparative social scientific inquiry is not a "species of inquiry independent from the remainder of social scientific inquiry" and that "the analysis of phenomena in evidently dissimilar units (especially different societies or cultures) should have no methodological problem unique to itself". Likewise, Armer (1973, p. 50) asserts that the continuity between comparative and non-comparative research exists because their respective goals are identical: "to explain phenomena by establishing controls over the conditions and causes of variations". Thinking that there is nothing truly distinctive about comparative social science and that all social scientific methods are comparative methods is sound and attractive because, as Ragin (1989, p. 2) observes, it suggests that "social science sub-disciplines are united by their methods". The question of equivalence has been particularly pertinent in the present project, as the comparison focuses not only on people's actual patterns of thoughts and actions, but also on their cultural standards, their definitions of what nature is and what it is not, and on their own roles in the current environmental discourse. The obvious problem was to compare something as elusive as ideas on nature. The choice of two countries with a similar background may meet some of the difficulties involved in the quest for equivalence. (Both the United States and Australia are vast territories with enclaves of wilderness, and Western culture cohabits with indigenous culture). However, struggles of interpretation remain when differences and similarities occur within the same group of interviewees.

This study is a cross-cultural comparative research. What does comparing cultures entail? Culture has been defined in many ways. Hofstede (2001) sums it up when he says that culture is to a human collectivity what personality is to an individual. More explicitly, one well-known anthropological consensus definition proposed by Kluckhohn (1951, p. 86) runs as follows:

Culture consists in patterned ways of thinking, feeling and reacting, acquired and transmitted mainly by symbols, constituting the distinctive achievements of human groups, including their embodiments in artefacts; the essential core of culture consists of traditional (i.e. historically derived and selected) ideas and especially their attached values.

As Kluckhohn explains, ideas are expressions of inner values. Analysing people's ideas offers a deep understanding of the values they share as a community. Rokeach (1972, pp. 159-60) states that:

To say that a person 'has a value' is to say that he has an enduring belief that a specific mode of conduct or end-state of existence is personally and socially preferable to alternative modes of conduct or end-states of existence.

Everything is related in the end because beliefs express themselves in ideas, which express themselves in actions. Ultimately, this study aims to analyse the country's 'psyche' since ideas are unconscious beliefs become conscious and are only the tip of the iceberg. As Bateson (1967, p. 114) argues, "that which we know best is that of which we are least conscious... the process of habit formation is a sinking of knowledge to less conscious and more archaic levels."

Studying variations in cultures in the United States and in Australia was perceived as the best way to understand people's values and ideas about nature because a culture is a reliable mirror into a country's psyche. Hofstede (2001, p. 34) thinks that cultures are extremely stable over time. "This stability can be explained from the reinforcement of culture patterns by the institutions that themselves are products of the dominant cultural value systems. The system is in a self-regulating quasi-equilibrium". Change, Hofstede goes on, usually comes from the outside, in the form of forces of nature or forces of human beings (i.e. trade, conquest, economic or political dominance, technological breakthroughs). The advent of the Internet in the 2000s has been a major technological breakthrough that made relevant understanding how digital technological is altering the cultural system and human relation to nature. Because all countries are gradually exposed to the same scientific and technological discoveries, and because these play an important role in cultural change, some authors have concluded that all societies will become more and more similar (Raikhan, Moldakhmet, Ryskeldy and Alua, 2014; Redfield, 2001). The cross-cultural comparative method may give a unitary character to the data being studied by interrelating a variety of facts to a single concept (here dualistic cultural concepts on human and nature), but it also provides an opportunity for the analysis of many specific details that are often overlooked with other methods (Theodorson, 1969).

Ultimately, the goal, in a social scientific context, is to initiate a common lexicon of concepts that will serve as an instrument for comparative research and will become part of the sociological vocabulary, helping other researchers in their work. Yet, comparative methodology remains difficult in regard to the complexity and diversity of the data collected. In the words of Oyen (1990, p. 13), it takes "a sociological eye to analyse a particular experience and to understand what is universal about it. Part of the sociological imagination is to perceive processes that transcend nations and cultures". I agree with her when she (Oyen, 1990, p. 2) claims that the search for answers reaches beyond "theoretical fragments and joins the eternal search for basic patterns of human behaviour which transcends all cultural influences".

3.2.2. Cross-cultural sequential explanatory design

I selected a cross-cultural mixed methods design in accordance with the research aim to break down binaries/dualisms, and explain the complex interactions between natural and human systems. The main research questions involved an analysis of nature-related Western binaries and the cultural, social, and philosophical beliefs associated to them. A qualitative approach was necessary to understand why people hold particular thoughts and beliefs. To contextualise these beliefs and understand their interactions with the digital, I also had to evaluate digital technology usage and digital habits of the American and Australian participants. Additionally, this study being a comparative study, I wanted to generate a large enough amount of data for validity and credibility purposes. This was made possible with the online survey. Mixed methods was deemed an appropriate choice because the combination of both quantitative and qualitative approaches was the best way to promote convergence, corroboration, and correspondence of results in the analysis of these key notions (Kadushin, Hecht, Sasson, and Saxe, 2008).

The mixed methods cross-cultural design is defined as sequential explanatory because data collection involved two sequential phases. Phase one included an online survey conducted concurrently with the American and Australian groups, and phase two followed with in-depth interviews. As the figure below illustrates, both phases of data collection were done concurrently with the American and Australian groups, and the integration of methods took place in the transition between phase one and phase two of data collection (Schrauf, 2018).

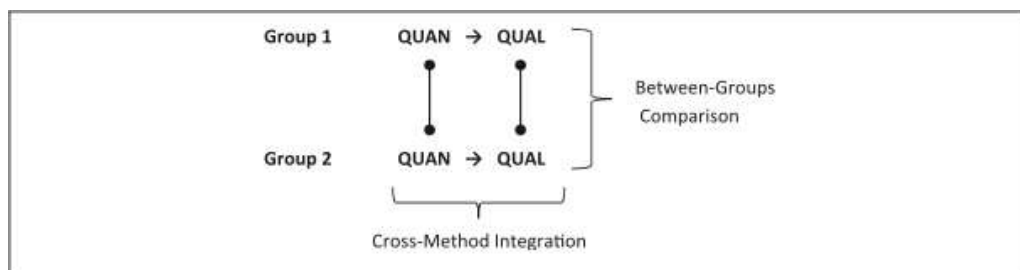


Figure 2.

The cross-cultural design (Schrauf, 2018)

The sequence and dominance, or priority, of each method were decided to best answer the research questions. The first phase of data collection (the survey), which was predominantly quantitative with some qualitative open-ended questions, helped develop and inform the second phase (interviews), which was qualitative. The priority or dominance refers to the weighting of the quantitative or qualitative methods for answering the research questions. Creswell (2009) explains that there are three possible weighting options for a mixed methods study: (1) Equal priority, so that both methods play an equally important role in addressing the research problem; (2) Quantitative priority, with a

greater emphasis on the quantitative methods and secondary use of the qualitative methods; and (3) Qualitative priority, where a greater emphasis is placed on the qualitative methods and the quantitative methods are used in a secondary role. In this study, more weight was attached to the data coming from the core qualitative component. The supplemental quantitative component ensured validation and development of data. The survey allowed for the initial generation of rich data, and the semi-structured interviews served to develop the analysis and build on the survey initial findings. The sequential approach from phase one to phase two included a purposeful sampling of the participants (Greene, Caracelli and Graham, 1989). The diversity of views offered by mixed methods helped identify diverging views of the same phenomenon while enhancing the integrity of findings, and consequently, their credibility (Bryman, 2006). It served to uncover relationships between variables and it supported the comparative approach. In isolation, neither of these methods could provide the same insight as can their combination. It was used as a means of avoiding biases intrinsic to single-method approaches (Denscombe, 2008). Complementarity of data helped the elaboration of the thesis argument and the clarification of the results from the quantitative method with the results from the qualitative method. The cross-cultural method was necessary to explain, identify and analyse differences between the American and the Australian cultures and to determine whether the shared phenomena could be explained by the same causes (Hantrais, 1995).

3.2.3. Netnography: Research and digital technology

Because it is based in participation, a netnographer should reach out in some sense, a human voice trying to find another human voice amidst the technology, and then write about the experience. (Kozinets, 2015, p. 68)

Netnography is a media-based methodology developed by American researcher Robert Kozinets in 1997. Media methodology can also be referred to as virtual ethnography, cyber-ethnography, online ethnography, web ethnography, smartphone ethnography or digital anthropology among other expressions (Dicks, Mason, Coffey & Atkinson, 2005; Hine, 2000; Puri, 2007). It is an adaptation of ethnographic research techniques for the purpose of studying communities and cultures online (Kozinets, 2010). Kozinets (2015, p. 79) offers the following definition of netnography:

Netnography is the name given to a specific set of related data collection, analysis, ethical and representational research practices, where a significant amount of the data collected and participant-observational research conducted originates in and manifests through the data shared freely on the Internet, including mobile applications.

I wanted to acknowledge the netnographic dimension of the study. The greatest part of the research, participants selection, data collection and data analysis were done online, using a digital device, in this case, a computer. Netnography has been an important tool that provided access to the rich world of data available online, and helped develop one of the goals of the thesis: to understand human to

nature and human to technology interactions and experiences. As Kozinets (2015, p. 4) points out, the variety in data that the Internet has to offer places the researcher's work "somewhere between the vast searchlights of big data analysis and the close readings of discourse analysis."

The netnographic approach is flexible. It allows the researcher to use both online data sources and a traditional ethnographic approach of face-to-face interviews. Elliott and Jankel-Elliott (2003, p. 215) argue that netnography aims to develop a "thick description" of the real experience of the participants, and in order to do so, the researcher is invited to expand to various methods of a more conventional ethnographic approach. Kozinets (2010, p. 75) mentions that an additional element of ethnographic insight allows the analysis to go beyond the "flat and two-dimensional" analyses of former online methods. In this respect, this study engaged in both online, face-to-face and email interviews during the data collection phase, and this mixed approach provided a better understanding of the human experience of nature in the digital age as detailed in the following parts of this chapter. Sandlin (2007) acknowledges that netnography and ethnography are similar because netnography allows the researcher to understand the practices of virtual communities in the same way that anthropologists try to understand that of face-to-face communities. Likewise, Creswell and Clark (2007) claim that it captures the advantages of an ethnographic study by allowing the researcher to decode the shared meaning, values, behaviours, beliefs, and shared language of a cultural group while eliminating the negative by-products often involved in conducting a traditional ethnography, keeping only the benefits, and also adding the benefits of online technology. The netnographic approach of my research offered many benefits in the context of a cross-cultural study. These benefits included a gain of time and a gain of money realised from not having to travel abroad and from selecting participants from two different countries and conducting parts of the Australian interviews and all of the American interviews online. Additionally, the richness and variety of cases found online and fitting my research scope in the search and selection of pro-environmental participants provided ideas that I may not have come across had I done the selection by physically travelling there.

3.3. Data collection

Data collection consisted of two phases. Phase one data was gathered via an online survey and Phase two, semi-structured interviews. The goal of the first phase was to identify the predominant views and beliefs on nature-related Western cultural binaries and to discover their relations with digital technology usage. The goal of the second phase was to confirm and develop the findings of the first phase.

3.3.1. Phase One: Cross-sectional online survey

The mixed methods research design involved a Web-based instrument to collect data. A cross-sectional online survey was chosen as the main vehicle to collect quantitative and qualitative data during the first phase of data collection. Cross-sectional surveys make inferences about a population of interest at one point in time, and, as such, they have been described as snapshots of the populations about which they gather data (Punch, 2014). The survey was done using the program SurveyMonkey, an online survey development cloud-based software founded in 1999 by Ryan and Chris Finley. The survey was done concurrently for both countries over a five-month period (March to July 2019). Using the Internet to conduct research presents challenges not found in conventional research, yet many studies support the use of online surveys (Andrews, Nonnecke, and Preece, 2003; Kozinets, 2015). Baker (1998) argues that online self-administered surveys will become the next major step in the advancement of computer-assisted survey information collection. Some of the main advantages of using online surveys include cost savings associated with eliminating printing and mailing of the survey questionnaire (Kaplowitz, Hadlock and Levine, 2004). SurveyMonkey offered many advantages for this study. It included statistical tools for data analysis, sample selection, bias elimination and data representation tools. It helped reduce time and cost involved in data collection, the results were uploaded into an Excel sheet for analysis, and the data was secured online and constantly accessible. Additionally, the software allowed for the calculation of response rate or view rates to understand the extent of distribution, the survey could be sent via email as a link or share on social media (Nagalakhmi and Trivedi, 2015). These tools made preliminary analysis easy and provided reliable and coherent data information to inform the interview questions and the second phase of data collection. Moreover, SurveyMonkey was useful in making possible the creation of a customisable professional survey that would add to the professional quality of my work and foster a sense of trust in subjects thus improving participation. Connecting to people online can be a difficult task as far as trust and reliability are concerned, so it was important to provide each person I contacted with enough information and transparency on my work and myself to get them involved in the survey. The high response rates and increased level of data quality achieved in this study confirmed that web-survey software are efficient and user-friendly tools for research.

3.3.1.1. Participants selection (United States – Australia)

The selection of the participants for the online survey necessitated a purposeful sampling strategy. Purposeful sampling is widely used in mixed method research for the identification and selection of information-rich cases related to a phenomenon of interest (Meyer, 2008). It means sampling in a deliberate way, with some purpose or focus in mind in order to maximise efficiency and validity (Morse and Niehaus, 2009). Purposeful sampling is described by Marshall (1996, p. 523) as the most common sampling technique: “The researcher actively selects the most productive sample to answer the research question.” The choice of the purposeful sampling strategy for this study adhered to the general principles that govern all forms of sampling as defined by Kemper, Stringfield, and Teddlie

(2003): (1) the sampling strategy stemmed logically from the research questions addressed by the study; (2) the sample was able to generate a thorough database on the type of phenomenon under study; (3) it allowed the possibility of drawing clear inferences and credible explanations from the data; (4) the sampling strategy was ethical; (5) the sampling plan was feasible; and (6) the sampling scheme was as efficient as practical.

Participants for this study were chosen based on the prior hypothesis that they shared particular characteristics which enabled detailed exploration and understanding of the central problematic of Western cultural dualisms on nature. These characteristics related both to specific experiences and behaviours possessed by the subjects and to demographic attributes. The criteria for selection were as follows:

- (1) subjects had to be American or Australian
- (2) they had to demonstrate pro-environmental behaviours
- (3) they had to be digital technology users

(1) Subjects had to be American or Australian

North America and Australia, as sites of study, were chosen because they share the characteristics of having industrialised, urban areas and wilderness areas. Contrary to Europe, which has been civilised and built for longer, North America and Australia are some of the last countries in the Western world with areas of nature that have not been altered by modern human infrastructures (Watson et al., 2018). They have a long history of nature conservation and extended academic writing on the human-nature relationships as the literature review has shown. They come from European settlements and share their territories with indigenous populations. These geographical and historical qualities make nature an important part of their cultural identities.

(2) Subjects had to demonstrate pro-environmental behaviours

This study uses the definition pro-environmental behaviours (PEBs), which are also called ecological behaviours, green behaviours or environmental behaviours (Cushman-Roisin, 2012; Kaiser, Ranney, Hartig, and Bowler, 1999; Kollmuss and Agyeman, 2002). PEBs are defined as behaviours that consciously seek to minimise the negative impact of one's actions on the environment. Pro-environmental individuals express an interest in the issue of environmental concern, or environmental consciousness (Zelezny and Schultz, 2000) and act towards environmental sustainability. Environmental behaviours include limiting energy consumption, avoiding waste, recycling, or environmental activism (Mesmer-Magnus, Viswesvaran and Wiernik, 2012). These behaviours may be public (participating in a rally for an environmental cause), or private (composting, reducing water use), and they are always volitional, rooted in the individual's own initiative. Although societal structures, such as the presence of a public transportation system or recycling program in one's city, may support or hinder PEBs, acting in ways that benefit the

environment is ultimately a personal choice. PEBs are also related to the individual's own ideologies and values and, as such, reveal cultural beliefs (Gifford, 2011). I deliberately focused on pro-environmental individuals for the following reasons:

- Pro-environmental values indirectly influence societal and political debates around sustainability in the current ecological crisis context (Janmaimool and Khajohnmanee, 2019), and the goal of this study is to evaluate current beliefs about nature in order to question and serve the cultural, social and political debate on sustainability. Millner and Ollivier (2016) argue that beliefs constrain policy choices, so it is important to understand how beliefs are formed, whether they are biased, and ultimately how they filter through the political system to affect policy. As McKenzie-Mohr (2000) argues, studying ecological human behaviours is not the prime target but a means to understand and modify behavioural consequences such as levels of pollution, resource savings, and energy quantities.
- The Internet-based netnographic research meant that participants would be selected and contacted online. To reach a large amount of people across two countries in a limited period of time, the research project had to start with a purposeful sampling. There is a very large amount of pro-environmental communities and individuals online and they usually freely share contact information. The selection process focused on ecovillages, green activist associations, urban and rural homesteading initiatives, zero-waste initiatives, community gardens, and environmental faculties. The choice of pro-environmental participants was also made for convenient reasons. Sampling in cross-cultural research can be difficult and complex because different populations are used (Woolf and Hulsizer, 2011). In this study, problematic issues related to self-identification (naming participants) and hidden populations (finding participants) have been encountered, justifying the use of purposeful sampling. Initially, the recruitment strategy for participants required defining the terms used for persons with an experience in nature and digital technology. Studies on the subject of nature and digital technology are in their infancy since the Internet is still a new phenomenon, and it was as difficult labelling the target population for the research project and providing a name which potential participants would identify with. As an example, here is the text that I shared online and published in magazines to invite people to take the survey:

Want to help research? As part of my PhD research, I am launching an online survey to understand how people perceive nature today. You are living a green lifestyle, you are low- or zero-waste, you are homesteading in a rural or an urban context, you are an eco-activist or you simply love nature? Every eco-conscious person, above 18, is invited to participate. The survey is done online, and takes 15 minutes to answer!

(3) Subjects had to be digital technology users

While people use to rely on traditional media, localised campaigns and grassroots movements to spread awareness on environmental problems, today, most pro-environmental groups – from formal

organisation like GreenPeace to radical protest groups – and individuals use the Internet to convey ecological messages. The practice is even more common in smaller groups and individuals due to what Tilly (1978) calls Resource Mobilisation Theory (RMT), in which case individuals become environmental advocates. The theory revolves around the central notion of how messages of social change are spread from person to person and from group to group. The conditions needed for a social movement are linked to the grievances shared by multiple individuals and organisations, their ideologies about specific causes, and how to reduce those grievances (Hisschemöller and Sioziou, 2013; McCarthy and Zaid, 1977). The ideas and values that online messages contain both mirror and shape environmental discourses more widely in a social and cultural context. The Internet is becoming the place where sustainability is being redefined (Kurniawan and Rye, 2013). The netnographic dimension of the current study ensured that whoever took part in the survey was already familiar with digital technology. Digital technology and Internet-based activities have become such a predominant part of people's lives today (Lanier, 2010; Louv, 2005), regardless of age categories, that this selection criterion was the easiest one to achieve. Digital technology users were required to test Western cultural beliefs on nature in a digital context, to understand whether digital technology helps or hinders a relationship with nature, and to understand whether nature exposure alters digital habits. The term *digital technology user* was favoured over other expressions such as *digital native* and *digital immigrant*. Prenzy (2001) coined the terms *digital native* and *digital immigrant* to refer to persons born after 1980 who have grown up using digital technology (Millennials and Generation Z members, or iGen, are considered digital natives), and persons born before 1980 who have acquired familiarity with digital systems as adults. Although these terms were interesting, they emphasise a digital gap regarding the ability of technological use among younger and older generations, which the findings of this study did not confirm. A more neutral expression was selected to encompass all age categories and avoid generational stereotypes.

3.3.1.2. Pilot study

To improve the validity of the survey (Dillman, Smyth and Christian, 2014), I started with a pilot test using a convenience sample of James Cook University students (undergraduate and postgraduate) to ensure its suitability. I have found the method useful in finding problems and barriers related to participants' recruitment, in being engaged in research as a researcher, in assessing the acceptability of interview protocol, and in determining epistemology and methodology of research (Janghorban, Roudsari and Taghipour, 2013). A number of students answered the survey, which helped me review the questions in regard to wording, comprehension, completeness, and relevance issues. As a result of the pilot study, refinements were made to questions 12, 13, 17, 18 and 21 of the large survey (Appendix A). Survey question (SQ) 18 (*How do you distinguish between nature, wilderness, and the bush?*) was a new question created after comments from Australian students who related wilderness to the bush while American participants either did not know the concept or view

the bush as typically Australian. The bush being an Australian cultural concept, I pondered over keeping the same question for the American survey and concluded that it would be interesting to do so. The pilot study was also helpful in discarding vague or unrelated questions based on the students' reactions to them (their enthusiasm, or absence of it, for the matter). In the end, most of the questions that were kept for the final questionnaire were often commented upon as being "challenging", which became an indicator that I had to dig that way. Later on, when the survey was launched online, many respondents emailed me to share similar remarks (i.e. "That was tough", "mindboggling". "it really got me thinking", "it made me see things differently", etc.). Swanwick (1994) confirms the importance of intuition in research and qualitative analysis, stating that researchers are "engaged persons with an interpretative role" rather than just "neutral gatherers of data" (1994, p. 57).

3.3.1.3. Survey questionnaire

The online survey was carried out, collecting responses from 220 individuals (118 Americans and 102 Australians). Data was collected between February and July 2019. Two surveys were set up conjointly, one for each country, and participants were either sent the link for the American survey or for the Australian survey based on their nationality. Both surveys had exactly the same questions (see Appendix A) but were released separately to avoid confusion between American and Australian findings and facilitate comparative purposes. The online survey questionnaire (Appendix A) was composed of 29 entries and divided into three sections. It started with an introduction to present the research project, the research outcomes and myself and was followed by a consent form tick box entry. The first set of questions formed a section on demographic information including age, location, gender, yearly income, educational status, and employment status. The second section offered questions about ideas and beliefs on nature and helped measure the environmental concern of both groups of respondents. The last section focused on Internet usage, the typical number of hours spent online per day and the purpose of the Internet in relation to pro-environmentalist behaviours.

Participants' opinions on nature (SQ 12) were assessed on a five-point Likert scale including *strongly agree*, *agree*, *neither agree nor disagree*, *disagree* and *strongly disagree*. Occurrences of feelings (SQ 15) were assessed on a five-point Likert scale including *a great deal*, *a lot*, *moderately*, *a little* and *not at all*. The scale used for SQ 16 was customised for the needs of my study based on Clayton's theory on environmental identity (2003). It followed a six-point Likert scale including *completely separate from nature*, *mostly separate from nature*, *slightly separate from nature*, *slightly part of nature*, *mostly part of nature* and *completely part of nature*. On the other hand, SQ 14, SQ 17, SQ 19, and SQ 21 were assessed on a two-point, dichotomous scale via Yes/No questions. The amount of time spent using the Internet in a typical day offered five options: *1 hour or less*, *1-2 hours*, *2-5 hours*, *5-8 hours* and *more than 8 hours*. Frequency of using various Internet applications such as social media and emails (SQ 23, SQ 24) was assessed on a five-point Likert scale including *never*,

rarely, sometimes, often and constantly. SQ 26 aimed to assess on a two-point, dichotomous scale emotional attachment to digital technology. Many studies discuss the negative side effects of screen time such as stress or digital addiction (Cash, Rae, Steel and Winkler, 2012; Hoge, Bickham and Cantor, 2017). In the current study, understanding psychological and emotional effects of using digital technology prefigure the interview questions 7 to 10 in assessing mind/body dualism as linked to digital usage in the perspective of including the human/nature dualism as part of other cultural binaries. The last question, SQ 27, aimed to understand the interactions between digital time and connection to nature.

Overall, the survey was composed of 16 close-ended questions, 2 open-ended questions, and 8 mixed questions. Close-ended questions are questions whose answers are chosen by the researcher (multiple choice, Likert scales...), open-ended questions promote answers that are free-form and encourages creativity and self-expression from the respondent (comment box), and mixed questions start with a close-ended question and are followed by a comment box (Allen, 2017). In the latter case, the comment box provided an open-ended question that asked ‘Can you explain your answer?’, followed by an unlimited comment field explicitly linked to the question immediately preceding it. This data collection strategy can be fairly intuitive for participants and offered the advantage of the resource to post extensive comments that will complement the quantitative analysis and the interview data. The ratio of quantitative to qualitative questions (24 quantitative questions / 10 qualitative questions) gives the survey quantitative priority, with a greater emphasis on the quantitative methods and secondary use of the qualitative methods. Yet, as the follow-up interviews were strictly qualitative, the mixed methods is predominantly qualitative and the quantitative methods are used in a secondary role and to ensure validation and development of data (Creswell, 2009).

Table 1.

Methodological overview of the survey questionnaire

Survey Questionnaire				
	<i>Question</i>	<i>Quantitative</i>	<i>Qualitative</i>	<i>Mixed</i>
Demographics	Q2			
	Q3			
	Q4			
	Q5			
	Q6			
	Q7			
	Q8			

Connecting to nature in the digital age

	Q9			
	Q10			
	Q11			
Nature	Q12			
	Q13			
	Q14			
	Q15			
	Q16			
	Q17			
	Q18			
	Q19			
	Q20			
	Q21			
	Digital	Q22		
Q23				
Q24				
Q25				
Q26				
Q27				

During data analysis, the mix of structured and unstructured responses helped me prepare the second phase of data collection and bring validation and clarity to the interview questions (Creswell and Clark, 2007). I was also able to understand dominant beliefs on nature and technology that prevailed in a large group of participants and contextualise them with the responses from the interviews. The survey ended with a conclusion including an invitation for participants to take part in a follow-up interview and to leave their contact if they wanted to win iTunes vouchers. The iTunes vouchers were an incentive used to get more individuals to take the survey, as incentives have been shown to be an efficient tool in large surveys related to social research that might lead up to a 30% increase in response rates (Yu, Alper, Nguyen, Brackbill, Turner, Walker, Maslow and Zweig, 2017).

3.3.1.4. Survey procedure

The survey procedure was based on the method proposed by Dillman, Smyth, and Christian (2014), which consists of an initial survey invitation and follow-up contacts and reminders. The approach started with email messages to enquire about the recipients' willingness to participate. Upon

acceptance to taking the survey, a personalised invitation email with all the instructions and a link to the survey was sent out. This email served to introduce the survey and to contextualise the research. It explained that confidentiality and anonymity about the survey responses were assured for all participants, that consent would be taken from the participants at the time of registration, and it detailed why their responses were important for the research project. Recipients were also approached to recommend others to participate in the survey. This practice is known as snowball sampling (Marshall, 1996). A couple of weeks after the initial invitation, a reminder email was sent to those who had not yet responded to the survey. This email explained that a survey invitation had been sent and asked those to respond who had yet to do so. Four or more weeks later, a final reminder was sent, highlighting that the study was drawing to a close and that there was only a short amount of time left to complete the survey.

It is important to acknowledge the limitations of selecting and contacting participants for a research project via the Internet. A limitation of Web-based research is online trust (Bauman and Bachmann, 2017). As a researcher, I had to offer a transparent and coherent online representation of myself to help people connect to me. Each email was sent with a text explaining the research, the project, the survey and the outcomes. Each email came with a link to my JCU homepage which featuring portrait and CV to guarantee credibility. Recipients often checked my profile and told me so. The outreach of researching online can seem flimsy but the human connection is authentic once the ‘virtual wall’ (Kozinets, 2015) is broken. Managing to involve participants in an online survey is a sign of trust both from them to me and me to them. This is where doing a netnography becomes bigger than just using digital technology to contact people and that the digital device itself holds its own part of magic as you feel you have not only been able to reach persons living on a different continent while staying at home but you have connected minds, or consciousness, even though you do not get to meet their physical self (Chorost, 2011). The role of ethics in developing online trust in the context of a netnography is also important and will be discussed in point 3.5.

3.3.2. Phase Two: In-depth interviews

The second phase of data collection was strictly qualitative and took place between July and October 2019. There are several methods to collect qualitative data. They usually involve direct interaction with individuals on a one to one basis or in a group setting (May, 1991). Creswell and Clark (2007) explain that the main methods for collecting qualitative data are individual interviews, focus group, observations, and action research. Wolcott (1992) sums it up by saying that qualitative data is collected through asking, watching, and reviewing. I agree with Gill, Stewart, Treasure and Chadwick (2008) that what qualitative study seeks to convey is *why* people have thoughts and feelings that might affect the way they behave. The role of the researcher is to attempt to access these thoughts and feelings and this is not an easy task, as it involves asking people to talk about things that may be very personal to them.

In this respect, individual interviews were considered the best way to reach that goal and to study the nature-human-digital relationship in a Western context.

3.3.2.1. Participants selection (United States – Australia)

It takes some training to hear, behind the solo of a human voice, the music of society and culture in the background. This music is all the more audible if, in conducting the interview, in asking the very first question, in choosing, even earlier, the right persons for interviewing, one has worked with sociological issues and riddles in mind. (Bertaux, 1990, p. 168)

In a cross-cultural mixed methods design, the integration of methods takes place in the transition between phase one and phase two of data collection, and the quantitative and qualitative phases are connected in the intermediate stage when the results of the data analysis in the first phase of the study guide the data collection in the second phase (Schrauf, 2018). The survey findings extended the debate on nature-related dualisms to other Western cultural binaries and their relations to digital technology use (see chapters 4 and 5 for findings). Similar themes were identified in the survey answers with subtle yet significant differences between the Australian and American answers. Criteria for participants selection were as follows:

- (1) Survey respondents' willingness to be interviewed (persons who shared contact details in the survey)
- (2) Demographic characteristics (gender, age, location, income)
- (3) Conceptual qualities (based on the participants' overall survey responses)

The survey findings showed differences in demographic characteristics among both groups that I wanted to balance out. The first criterion for selection was to find similar numbers of women and men relatively representative of age groups to test age and gender biases regarding nature perceptions and digital usage, and to promote geographical and social diversity. As I will explain in Chapter 4, viewing nature as human-exclusive was predominant over viewing nature as human-inclusive. Moreover, participants' digital habits were diverse, ranging from being barely connected to being constantly online. I selected participants upholding both views and demonstrating diversity in digital usage. Participants representing the predominant view (nature as human-exclusive) and participants representing the subsidiary view (nature as human-inclusive) were both instrumental to answer the research questions. Singling out respondents whose answers differed from the norm was important to triangulate qualitative findings, quantitative findings and demographics (Punch, 2014). And selecting participants who were typically representative of the dominant tendency was necessary to give perspective to findings. Within these main trends, differences appeared between the American and the Australian findings. For comparative purposes, respondents expressing variations within trends were selected as well. Limitations to participants selection were met, yet, the final sample of interviewees constituted a somewhat balanced-out representation of the survey groups. Limitations

concerned response rates to follow-up emails. In SQ 29, participants were invited to share contact details for a follow-up interview. Of the initial 118 American participants and 102 Australian participants, 58 and 56, respectively, provided an email address. The response rates of 49.2% (US) and 54.9% (AUS) are considered good for survey standards (Fincham, 2008). Once selected, the potential interviewees were contacted by email. Few of the American persons that were contacted replied to the email. On the other hand, most of the Australians contacted replied and agreed to be interviewed. This required to start another selection process for the American sample and adapt my criteria to participants' availability and responsiveness. This resulted in an unbalance in the geographical distribution of the American interviewees as several of them (4/10) lived in the same state (i.e. Vermont) which may increase response bias.

3.3.2.2. Data collection

The second phase of data collection was conducted to develop specific topics revealed by the survey findings (i.e. environmental identity, human/nature dualism, digital solastalgia, mind/body dualism). The best way to cover these topics was to ask probing, open-ended questions to get to know the independent thoughts of the selected individuals in each group. Interviews are a very good way of accessing people's perceptions, meanings, definitions of situations and constructions of reality. It is also, as Jones (1985, p. 46) observes one of most powerful ways we have of understanding others:

In order to understand other persons' constructions of reality, we would do well to ask them... and to ask them in such a way that they can tell us in their terms (rather than those imposed rigidly and a priori by ourselves) and in a depth which addresses the rich context that is the substance of their meanings.

Longhurst (2009) writes that even though interviewers tend to prepare a list of predetermined questions, the interviews usually unfold in a conversational manner offering participants the chance to pursue issues they feel are important. This is exactly what happened in the context of the semi-structured interviews. She (Longhurst, 2009, p. 580) adds that while interviews do not "offer researchers a route to 'the truth', they do offer a route to partial insights into what people do and think".

There are three fundamental types of research interviews: structured, semi-structured and unstructured (Mason, 2002). All types share the main quality that individual interviews are a mutual construction and have flexible sequence so that any idea or claim can be explored (Armer, 1973). For this study, structured and semi-structured interviews were favoured over unstructured interviews. Structured interviews were used for email interviews and semi-structured interviews were used for face-to-face meetings. Structured interviews are generally based on a rigorous set of questions and are chosen for being quick and easy to administer. Punch (2014) argues that they only allow for

limited participant responses and may be constraining if depth is required. The semi-structured interviews served to balance this potential lack of depth. However, this study's findings show that lack of depth could be met regardless of the interview type and seemed directly related to the interviewee's personality. Some structured interviews provided the most profound answers while some semi-structured interviews remained short and sterile. Semi-structured interviews are sometimes called focused interviews and work best when a number of predetermined areas has to be addressed (Glesne, 2006). The open-ended nature of their questions provides opportunities for both interviewer and interviewee to discuss some topics in more details (Gill, Stewart, Treasure and Chadwick, 2008). As for unstructured interviews, they are interesting because they do not reflect any preconceived theories or ideas (May, 1991) but, because they are performed with little to no organisation, they lack the focus that the second phase of data collection necessitated for this study.

3.3.2.3. Interview questionnaire

The structured email interviews and semi-structured in-person interviews were based on the same questionnaire composed of 10 entries (Appendix D). It was the result of the survey's preliminary analysis and was designed to move from the general to the specific, and to understand in more details the results generated by the quantitative analysis by asking open-ended questions on the human-nature-digital relationships. The interview questions (IQ) used for the structured email interviews were adapted as an interview guide for the semi-structured – in-person and Skype – interviews. For the latter, the list of questions were considered topics that I would explore and was helpful in bringing coherence when interviewees would divert during interviews conducted in person (King, 2004). To start with, IQ 1 and IQ 2 were designed to develop on the subject of human identity in relation to nature, and the notion of environmental identity (Clayton, 2003) in the context of Western cultural binaries. It helped test the Western concept of mind/body dualism, which is linked to the human/nature dualism according to ecofeminist theories (Plumwood, 1996). Then, IQ 3 and IQ 4 were designed to assess cultural assumptions on nature and wilderness. IQ 5, which generated a lot of emotional comments, correlated the notions of environmental identity and human/nature dualism while questioning modern notions such as sustainability. IQ 6 was related to the moral values sometimes associated to pro-environmental behaviours. A recurring answer in the survey was that humans are inherently destructive. This comment coming from eco-conscious people made me wonder if they meant (Western) humankind including them or everyone else except themselves. Finally, the section from IQ 7 to IQ 10 was about human-nature-digital relations. IQ 7 developed on the concept of digital solastalgia (see point 5.3.6) that was elaborated from the survey findings and based on Albrecht's concept of solastalgia (Albrecht, 2005, 2010, 2012, 2019). IQ 8 was designed to assess digital minimalism (Newport, 2019) in respect to interviewees' digital habits. IQ 9 and IQ 10 extended the human-nature relation to the human-nature-digital relation in the context of a mind/body

disconnect. It aimed to establish whether digital technology reinforced the human/nature dualism by creating a mind/body disconnect, and the extent to which it is a positive tool or a negative tool in the human-nature relationship.

3.3.2.4. Preparing and conducting interviews

Participants were contacted by email using the contact details they gave in the online survey. Initial emails included a reminder of the online survey which started five months prior, a reminder of the purpose of the study, an outline of the parameters of the interview process, and the need to record the interview if necessary. Patton (2002) argues that clear explanations about what to expect as part of the interview can ease the interview process. As mentioned at the end of the online survey, participants were offered the choice between face-to-face (FTF) interview, interview via VoIP (Voice over Internet Protocol) technologies (such as Skype or Zoom), and email interview. This helped maximise the number of persons agreeing to a follow-up interview. Upon agreement, informed consent was gained and arrangements for the interview were negotiated. Twenty interviews were conducted, 10 with Australian participants and 10 with American participants. For the Australian group, there were 3 FTF interviews, 1 VoIP (Skype) interview and 6 email interviews. For the American group, there were 4 VoIP (Skype) interviews and 6 email interviews. In-person interviews usually lasted between 45 minutes and one hour (the shortest interview took 30 minutes, and the longest interview one hour and a half).

At its most basic, an interview is a conversation. As Kozinets (2015, p. 59) frames it, it is “a set of questions and answers between two people who agree that one will assume the role of the questioner, and the other the role of the answerer”. The face-to-face interview, also called in-person interview, is probably the most popular and oldest form of survey data collection. Lavrakas (2008) argues that it is the best form of data collection when one wants to minimise nonresponse and maximise the quality of the data collected. It makes it easier for the respondent to either clarify answers or ask for clarification for some of questions, and it helps capture both verbal and non-verbal cues (i.e. body language, facial expressions). VoIP mediated interviews provide the ability to interview participants using voice and video across the Internet via a synchronous connection. The only difference between an online interview and a face-to-face interview is that the online interview occurs through the mediation of some technological apparatus. Like FTF interviews, they help, to a certain extent, capture body language and facial expressions. Lo Iacono, Symonds and Brown (2016, p. 1) argue that “the use of Skype affects the areas of rapport, non-verbal cues and ethics by creating limitations but also new opportunities”. Additional opportunities are related to time, space and financial constraints usually met in the context of FTF interviews. Mason (2002, p. 124) explains that Skype is an invaluable tool for researchers who want to study any human phenomenon

transculturally, he talks of encapsulating a “relevant range in relation to the wider universe.” I agree with Deakin and Wakefield (2013, p. 5) who posit that Skype provides “an opportunity to talk to otherwise inaccessible participants”. Web-based interviews have helped me connect with participants from a wide range of cultures and from different countries, breaking down the barrier of time and space (Burkitt, 2004). As for email interviews, they emerged during the late 1990s as one of a number of online qualitative methods. They differ from FTF interviews and VoIP interviews because of the features of asynchronicity (Given, 2008). They are primarily word-based, although typographic tricks can be used to convey emotions (i.e. emoticons, smiley...). In a way, they are closer to the situation of sending out a questionnaire in a survey than to the situation of a semi-structured interview. Yet they offer specific advantages. In-person interviews may be more spontaneous than email interviews but the latter allows the participants to reflect on their answers more than the former (Mann and Stewart, 2000). Flick (2009) suggests that email interviews can be improved if the researcher designs the collection of data more interactively. He recommends sending rows of questions separately to get clarification and to develop previous answers in a series of email exchanges. This is the technique I applied for the email interviews and it proved helpful in getting deep and thoughtful answers. Fielding (1993) argues that, in FTF interviews, the quality of data can be compromised when interviewees feel uncomfortable. This study confirmed these characteristics as some of the most interesting answers I received were from email interviews and some of the most sterile from FTF interviews. Overall, I found that the opportunities provided by computer-mediated communication (via VoIP and email interviews) proposed a viable and valuable research medium for conducting qualitative interviews, alongside the traditional FTF interviews.

3.3.2.5. Management of interview data

There are different ways of making a record of what is said and done during an interview, such as taking handwritten notes or relying on audio-recording (Cavana, Delahaye and Sekaran, 2001). In this study, both methods were adopted. VoIP interviews were recorded digitally to ensure the reliability of the data collection, and I also took notes to allow for analysis and further probing as the interview progressed. Web-based interviews were recorded using the recording functionality of QuickTime for Mac, and in-person interviews were recorded using a voice recorder. QuickTime is a multimedia framework developed by Apple, capable of handling digital video, picture and sound. Audio recordings were saved onto my computer and transcribed verbatim. I undertook the transcriptions and each transcript was reviewed to check for quality and to correct mistakes. Transcriptions were realised by listening to the audio files and typing the conversation into Microsoft Word. It took about seven hours for the manual transcription of each interview. The resulting files were added to the email interviews for the following stage of thematic analysis. Throughout the data collection period, I also maintained a folder of field notes to complement the interviews. Punch

(2014) observes that field notes allow the researcher to maintain and comment upon impressions, environmental contexts, behaviours, and nonverbal cues that may not be adequately captured through the audio-recording. These field notes provided an important context to the interpretation of the interviews and helped remind me of situational factors and elusive ideas that might prove relevant during data analysis.

3.4. Data analysis

3.4.1. Quantitative strand: Descriptive statistics and chi-square statistics

As explained previously, the quantitative strand of the study applies to some parts of the online survey. Quantitative methods emphasise objective measurements and the statistical and numerical analysis of data collected through surveys (Babbie, 2009). Quantitative analysis is a technique that seeks to understand behaviour by using mathematical and statistical measurements and to represent a given reality in terms of numerical values. The quantitative design for this study was descriptive (subjects measured once) – as opposed to experimental (subjects measured before and after treatment) – and aimed to establish associations between variables. Data analysis was done in two parts. A preliminary analysis was realised to identify key questions for the follow-up interviews. The preliminary analysis was made possible with SurveyMonkey analytical tools which offered charts and statistical measurements for all answers and permitted a quick and easy overview of the survey results. The analysis process started in proper once both phases of data collection were completed. The first stage of data analysis was data preparation. Survey data was first exported from SurveyMonkey and saved in .xls and .pdf formats on my computer. It was also stored in three different locations for safety measures, including a USB flash drive and two online file storage services (i.e. Dropbox and Google Drive). I then proceeded to clean the data sets. The large data sets that were produced included missing answers. Nonresponse is a significant problem for survey research and is said to be higher in self-administered questionnaires (Fielding, 1993). Unit nonresponse is different from item nonresponse. Unit nonresponse refers to the complete absence of an interview from a sample whereas item nonresponse refers to the absence of answers to specific questions in the interview after the person agrees to participate in the survey (Miles, Huberman and Saldana, 2013). Both data sets had unit and item nonresponse so I started by discarding empty questionnaires (unit nonresponse) and keeping the rest even when some answers were missing (item nonresponse). Survey answers are analysed in the next chapter based on the numbers of participants who provided answers even when inferior to the sum total. Response rates are not directly linked to data quality as many in the research profession had thought originally (Little and Rubin, 1987). The survey can be said to suffer from nonresponse bias when non-responders are uniquely different from respondents. Arbuckle (1996) confirms that bias does not come from the amount of non-response but

from situations where the types of people who participate (or do not participate) are not independent from the variables the project is designed to study.

Data was then analysed using Microsoft Excel analytical tools. This study being predominantly qualitative, quantitative data served to contextualise and complement the qualitative data. In this respect, I deemed descriptive statistics and chi-square statistics to be the best analytical approach. Mann (1995) defines descriptive statistics as simple summaries about a sample using a combination of tabulated description (tables), graphical description (graphs and charts) and statistical commentary (discussion of the results). Descriptive statistics are typically distinguished from inferential statistics. Where descriptive statistics present the data in a meaningful way so that patterns emerge and make interpretation easy, inferential statistics aim to describe and make inferences about the population from which the sample is drawn. Descriptive statistics are especially useful for large data sets as they help to simplify large amounts of data in a sensible way and reduces them to a simpler summary.

In the present study, within the domain of statistics, the chi-square test of independence was selected as another topic of focus. The chi-square test of independence (also known as the Pearson chi-square test, or simply the chi-square) is one of the most useful statistics for testing hypotheses when the variables are nominal (Coladarci, Cobb, Minium and Clarke, 2011; McHugh, 2013). The chi-square formula is:

$$\chi_c^2 = \frac{\sum (O_i - E_i)^2}{E_i}$$

In the formula, ‘O’ is the observed value, ‘E’ is the expected value, and ‘c’ stands for the degrees of freedom. A chi-square test is a statistical test used to compare observed results with expected results. The purpose of this test was to determine if a difference between the observed quantitative data from the online survey and the expected data was due to chance, or if it was due to a relationship between the variables (Bagdonavicius and Nikulin, 2011; Greenwood and Nikulin, 1996). Therefore, the chi-square tests were deemed necessary to better understand and interpret the relationships between the categorical variables. It is also worth mentioning that this test, like all tests of significance, only illuminates that there is a relationship and that that relationship has statistical significance (i.e., it is not due to chance) (Glass and Hopkins, 1996; McHugh, 2013). Running a chi-square test cannot tell anything about a causal relationship between variables. As Chow (1996) points out, we have to keep in mind that ‘statistically significant’ does not always imply ‘meaningful’ when using the chi-square test.

Although there are advantages and disadvantages to using quantitative analytical softwares, they are invaluable to avoid drawing charts by hand or undertake calculations manually. Microsoft Excel was chosen for its wide range of statistical functions and its graphing capabilities. As a

spreadsheet, Excel can be used for data entry, manipulation and presentation but it also offers a suite of statistical analysis functions and other tools that are useful for descriptive statistics. Data was presented in bar graphs (displayed either horizontally or vertically), pie charts, and cross tabulation. Graphs are a common method to visually illustrate relationships in the data. According to Slutsky (2014), the purpose of a graph is to present data that are too numerous or complicated to be described adequately in the text and in less space. Graphs are useful when the data shows pronounced trends or reveals relations between variables. Cross-tabulation, also known as contingency tables, or cross tabs, groups different variables to understand the correlation between. It also shows how correlations change from one variable grouping to another, and is usually used in statistical analysis to find patterns, trends, and probabilities within raw data. It is usually performed on categorical data (i.e., data that can be divided into mutually exclusive groups). It offers a simple method of grouping variables, which minimises the potential for confusion or error by providing clear results, and, since it clearly maps out relations between categorical variables, it is a useful tool to gain better and deeper insights. It was helpful to reflect on the scope of the cross-cultural comparison.

3.4.2. Qualitative strand: Thematic analysis

Thematic analysis is a qualitative method for identifying themes and patterns in data that are important and relevant to address the research questions (Gibbs, 2007). In selecting a method of data analysis, it is important that the method matches “what the researcher wants to know” (Braun and Clarke, 2006, p. 80), and therefore matches the requirements of the project’s aim and objectives. In the present study, I wanted the method to be able to provide patterns for organising: (a) perceptions and representations of nature in pro-environmental individuals, and (b) the impact of digital technology on the human-nature link. Other qualitative methods (i.e. narrative analysis, interpretive phenomenological analysis, discourse analysis, or grounded theory, etc.) also provide identification of patterns or themes, but they are tied to a specific theoretical or epistemological position, which results in limited flexibility in how the method is applied within the selected framework (Boyatzis, 1998; Urquhart, 2013, Van Dijk, 1985). On the contrary, thematic analysis is essentially independent of theory and epistemology and can be applied across a range of qualitative approaches (Braun and Clarke, 2006). Thematic analysis tends to provide a more detailed analysis of some aspect of the data and less description of the overall data, it organises and describes data sets in rich, minimal details (Braun and Clarke, 2006). It has been described as “one of the most common approaches to qualitative data analysis” (Bryman, 2008, p. 554). This study used the form of thematic analysis described by Braun and Clarke (2006), which involved the six following phases: 1) familiarising with the data, 2) generating initial codes, 3) searching for themes, 4) reviewing themes, 5) refining and naming themes, and 6) producing the report.

3.4.2.1. Familiarisation with the data

The first phase of thematic analysis involved immersion of the researcher in the data to get “familiar with the depth and the breadth of the content” (Braun and Clarke, 2006, p. 87). The qualitative data for the present study included all qualitative survey answers plus the interview answers. I had already realised a preliminary analysis of the survey answers to design the interview questions and had taken notes on recurring patterns. For the first phase of thematic analysis, I went through all survey answers in more details and highlighted specific quotes that seemed of interest to the study. This was followed by the repeated study of the interview transcripts and the email interviews where I noted impressions and ideas and compared them with those from the survey data set. In order to organise, store, and retrieve data, I used the qualitative data analysis software NVivo 12. NVivo provided a reliable tool to illustrate the reduced data in an accessible way and facilitated the process of data display. The use of a software program to code qualitative data has been both praised and decried by academics. Bazeley (2009) asserts that software programs offer a reliable tool to illustrate the reduced data in an accessible way and facilitated the process of data display. Contrarily, St John and Johnson (2000) argue that the advent of qualitative analysis software has increased pressure on researchers to focus on volume and breadth rather than on depth and meaning. Moreover, time and energy are spent learning to use computer packages, which may represent distraction from the real work of analysis. I decided to use the discourse analysis software NVivo as a complement to traditional thematic sorting and analysis to benefit from the advantages of both approaches. Whereas I deemed the traditional approach to be more complex and more detailed and to often lead to greater insights than the computer-assisted approach, I do acknowledge the benefits of a software program, especially for analysing large data sets.

3.4.2.2. Generation of initial codes

The second phase of data analysis meant generating initial codes from the data. As Bernard (2006) points out, data analysis is a search for patterns but also a search for ideas that could explain those patterns. In qualitative data analysis, codes are used to identify segments or passages of text, assigning symbolic meaning to the descriptive or inferential information (Miles, Huberman and Saldana, 2013). For Braun and Clarke (2006), there is a clear distinction between a theme and a code. A code captures one or more insights about the data and a theme encompasses numerous insights organised around a central concept. They often use the analogy of a brick house – the code is an individual brick, and the theme is the wall made up of numerous codes. There are also different levels at which the data can be coded: semantic and latent. Semantic codes identify the explicit and surface meanings of the data. The researcher does not look beyond what the participant said or wrote. Conversely, latent codes capture underlying ideas and assumptions, and require a more interpretative and conceptual orientation to the data. Braun and Clarke (2006) advise researchers to engage in both approaches and explore both semantic and implicit meanings of the data.

I analysed the texts in a process which involved several reiterative stages. I started by segmenting all texts in the data set into units of meaning. At this stage of open coding, the major categories were freely generated and referred to general descriptors of the data. Transcripts were re-read and as many headings as necessary were written down to describe all aspects of the content. I marked and coded text segments directly in the digital documents using both Excel and Word. If particular quotes stood out, I would mark and copy and paste them in a specific Word document. Codes were categorised according to their area of focus and these categories were then explored separately to identify sub-themes that related to each focal area. I kept several questions in mind during the coding procedure such as ‘how do people talk about and understand nature?’, ‘What assumptions are they making?’, ‘Why did I include these particular quotes?’. Several researchers of thematic analysis emphasise the importance of bracketing for dealing with bias in the coding phase (Ahern, 1999; Bazeley, 2009). I applied bracketing – via a reflexive journal – which is a method used in qualitative research to mitigate the potentially deleterious effects of preconceptions that may taint the research process (Tufford and Newman, 2010). Hanson (1994) argues that a reflexive journal is used to explore the researcher’s reasons for undertaking the research, and analyse potential preconceptions and assumptions regarding gender, sexual orientation, race/ethnicity, socio-economic status, etc., or the researcher’s personal value system. Paterson and Groening (1996) confirm that observational comments allow the researcher to explore feelings about the research endeavour. Among other examples, this practice helped me to acknowledge my own bias towards seeing human and nature as one when the thematic analysis showed that the human/nature disconnect was prevalent, or my bias towards digital technology as unhelpful in the human-nature relation.

3.4.2.3. Searching for, reviewing and defining themes

The search for themes started when all the data had been initially coded. Braun and Clarke (2006, p. 82) suggest that a theme captures “something important about the data in relation to the research question, and represents some level of patterned response or meaning within the data set.” The process involved sorting and collating codes into potential themes. Sub-themes were reviewed in the context of the overall data corpus, and overarching themes identified. Interview transcripts were re-read along the finalised list of categories and sub-categories to ensure that the codes comprehensively covered all aspects of the interviews. NVivo was helpful in the search for themes. The sorting functions helped to produce numerous sorts of the data extracts. Similar codes were grouped and regrouped together in a continuous process. Braun and Clarke (2006) suggest that the search for themes can be facilitated with some sort of visual representations, and NVivo functions such as word clouds improved data visualisation and therefore facilitated the identification of themes. The example below shows wordclouds

realised with NVivo of the American and Australian answers to survey question 13 where participants were asked to give their own definition of nature. It marks a difference between both groups, which will prove to be a recurring one. American participants, more than Australian participants, view nature as human-exclusive (hence the importance of the word human which is not as visible in the Australian wordcloud – see figure 3 nad figure 4 below).



Figure 3.

Wordcloud of American answers to SQ 13

Table 2.

Coding examples for the ‘Connectedness to nature’ theme

Meaning unit	Code	Category	Theme
<p>“Nature is not only a bodily experience, but also an intellectual/spiritual one. Intellectual engagement with nature, in my view, is not less important than physical experience.”</p>	<p>Nature as mind-body union</p>	<p>Healing Western cultural dualisms</p>	<p>Connectedness to nature</p>
<p>“Nature is all that is, especially living entities, even including humans, though they are also not natural in some ways.”</p>	<p>Defining human identity in regard to nature</p>		
<p>“I could convince myself that downtown Los Angeles might be called ‘nature,’ with a certain mind set.”</p>	<p>Importance of human intellect in defining nature</p>		

At the end of this phase, I also started preparing a number of graphs, using Excel, to help readers visualise the themes and sub-themes. In total, my analysis produced five main themes and ten sub-themes which are presented in the following chapter.

3.5. Ethics

When conducting research, one must be mindful of ethical and data protection issues. Ethical guidelines seek to work towards protecting the individuals involved in this study against any form of harm, manipulation or malpractice. Permission to conduct the study was granted from the James Cook University Human Research Ethics Committee (Ethic reference: H7105). The purpose of the Human Ethics Committee is to protect the welfare and rights of participants involved in any

research in accordance with the National Statement on Ethical Conduct Involving Humans (NHMRC), and James Cook University guidelines. As qualitative research involves enquiry and investigation into people's lives, experiences and behaviours (Denzin and Lincoln, 2000), the values and principles outlined by the NHMRC such as respect for human beings, research merit and integrity, justice, and beneficence were adhered to throughout the study (National Health and Medical Research Council, 2007). Informed consent was gained from all participants involved in the study in adherence to the NHMRC guidelines. According to the NHMRC, informed consent involves giving due scope to people's capacity to make their own decisions and that participation is the result of a choice made by participants (National Health and Medical Research Council, 2007). For the first phase of data collection, the online survey provided an introductory explanation that gave participants the right to: (1) give their informed consent to participate in the research, and, (2) decline to participate or withdraw their participation at any time. Prospective participants were requested to participate voluntarily in the research and were assured of anonymity, they were advised that they could withdraw up to any point until the survey was submitted, and that all data relating to the online survey would be securely stored and password protected. For the second phase of data collection (i.e. interviews), participants were provided with an information sheet (Appendix B) and a consent form (Appendix C) for clarification and endorsement prior to the conduct of interviews. It was also made clear that interviewees were free to withdraw from the study at any stage. Confidentiality was guaranteed to all individuals involved in the research. The online survey was anonymous and each participant was attributed a number by Survey Monkey. At the end of the survey, participants were free to provide their names and contacts if they wanted to participate in the follow-up interviews. All personal information and contacts were maintained in a secure location. All participants were also ensured that the level of analysis conducted and the reporting of findings would not allow for the identification of individuals. For the interviews, the consent form offered to interviewees the choice between using their real name or a false name for subsequent publications and conferences based on this study.

3.6. Conclusion

This chapter illustrates the decisions made throughout this research project as I integrated two very different research approaches (quantitative and qualitative) to fulfil the research aims. The cross-cultural dimension of the study benefited from mixed methods. The quantitative survey provided a big picture of the relations of pro-environmental individuals from different cultural settings to nature and technology while the qualitative interviews captured a more comprehensive understanding of the participants' perceptions. The following chapters will examine in details the quantitative and qualitative findings of the study.

4. Quantitative findings

4.1. Introduction

In this chapter, I use descriptive statistics to summarise and describe quantitative survey data in ways that make them easier to understand and that help identifying patterns. The first phase of data collection, the online survey, produced a set of quantitative and qualitative data. In this chapter, I am going to detail the quantitative findings of the online survey, leaving the qualitative results for the following chapter. I will go through each survey question to present the resulting answers from both the American and the Australian groups of participants (the survey questionnaire can be found in appendix A).

4.2. Response rate

As I explained in chapter 3 (point 3.3.1.1), the selection of the participants was based on the following criteria:

- (1) subjects had to be American or Australian
- (2) they had to demonstrate pro-environmental behaviours
- (3) they had to be digital technology users

A total of 218 emails were sent out to selected pro-environmental groups and individuals in both countries to present the study and invite to an online survey. As such, the survey analysis does not attempt to represent a random sample of the greater population. Of the 218 emails, 157 emails were sent in the US and 61 in Australia to reach a goal of 100 respondents in each country. (Emails were sent both to individuals and groups, and my invitation was sometimes posted on social media as well, so that one email could attract several respondents). In the US, the 157 emails were sent to 28 homesteaders, 17 zerowasters, 13 environmental organisations, 54 ecovillages, 39 community gardens and 6 ecology-related faculties within universities. In Australia, the 61 emails were sent to 10 homesteaders, 21 zerowasters, 6 environmental organisations, 10 ecovillages, 5 community gardens and 9 ecology-related faculties within universities. American recipients answered my emails and agreed to the survey less often than Australian recipients, which is why I was able to reach my goal of 100 participants in Australia while sending only 61 emails. As a result, 220 individuals responded to the survey, 118 individuals in the US and 102 in Australia. After survey completion, I reviewed answers and assessed nonresponse rates.

There is a difference between unit nonresponse and item nonresponse. Unit nonresponse refers to the complete absence of a questionnaire from a sample whereas item nonresponse refers to the absence of answers to specific questions in the questionnaire after the sample agrees to participate in the survey (Punch, 2014). I was not able to calculate the unit nonresponse rate because emails were sent to both groups and individuals so the initial number of persons involved

does not equate the number of emails sent and is unknown. The item nonresponse rate is as follows. For the US, of the 118 questionnaires, 36 were incomplete (they were either completely empty or with only the demographic part filled), which left a remainder of 82 completed questionnaires. For Australia, of the 102 questionnaires, 24 were incomplete for the same reasons, which left a remainder of 78 completed questionnaires. The original number of the sample included 220 individuals. The final sample included 160 completed surveys. The average response rate for both countries was 72.72%, and the response rate of Australia (76.47%) was better than the response rate of the US (69.49%).

Item nonresponse, which is characterised by blank gaps and missing data, is said to be higher in self-administered questionnaires (De Leeuw, Hox and Huisman, 2003). Response rates are not directly linked to data quality as many in the research profession had thought originally (and many still do think). In conceptual terms, bias does not come from the amount of non-response (or percentage of non-responders), it comes from situations where the types of people who participate (or do not participate) are not independent from the variables the project is designed to study. Put more simply, data quality is affected if, and when, non-responders are uniquely different from respondents in terms of the data the researcher is collecting, which was not the case for this study.

4.3. Demographic characteristics of the American and the Australian respondents

Respondents' socio-demographic characteristics are presented in narrative and in graphical and tabular formats. Socio-demographic information was necessary to contextualise and triangulate the qualitative and quantitative findings (LoBiondo Wood and Haber, 2010). This information will later be combined with further data for meaningful interpretation in the Discussion chapters (chapters 6, 7 and 8).

Location

Most American and Australian respondents were located in urban areas. Several ecovillages (located in semi-rural and rural areas) were contacted for the survey but few went on to take it. Some homesteaders answered the survey as well. They were located either in rural areas close to cities and towns or in urban areas. The maps below show the dispersion of respondents in both countries.

Connecting to nature in the digital age



Figure 5.
Locations of respondents in the US



Figure 6.
Locations of respondents in Australia

Age

Respondents predominantly belonged to the Millennial generation. Millennials are defined as the generation born between 1980 and 2000. For this study, 52.34% of Americans and 27.7% of Australians were Millennials (spanning the 18-23 and 24-38 age categories). Twenge (2017) makes a difference between the first wave of Millennials born between 1980 and 1995 and the second wave, born

Connecting to nature in the digital age

in 1995 and after, (which has been called iGen, Generation Z, or Net Gen among other expressions). Millennials were not necessarily born with digital technology while all iGen members are digital natives (Combi, 2015; Twenge, 2017). That difference has been respected in age categories during the survey design to compare digital technology habits and other traits. On average, for both American and Australian respondents, 28.67% were between 24 and 38, 21.48% were between 39 and 49, 19.23% were between 50 and 64, 15.31% were between 65 and 74, 11.39% were between 18 and 23, and 3.91% were 75 or older. In Australia, age categories were represented in a more balanced way with 23.33% of respondents being 39 to 49 years old, 24.44% 50 to 64 years old, and 22.22% 65 to 74 years old. Contrary to Australia, the US had fewer respondents aged 49 and above and had more 18-23 years old participants (US: 20.56% - AUS: 2.22%).

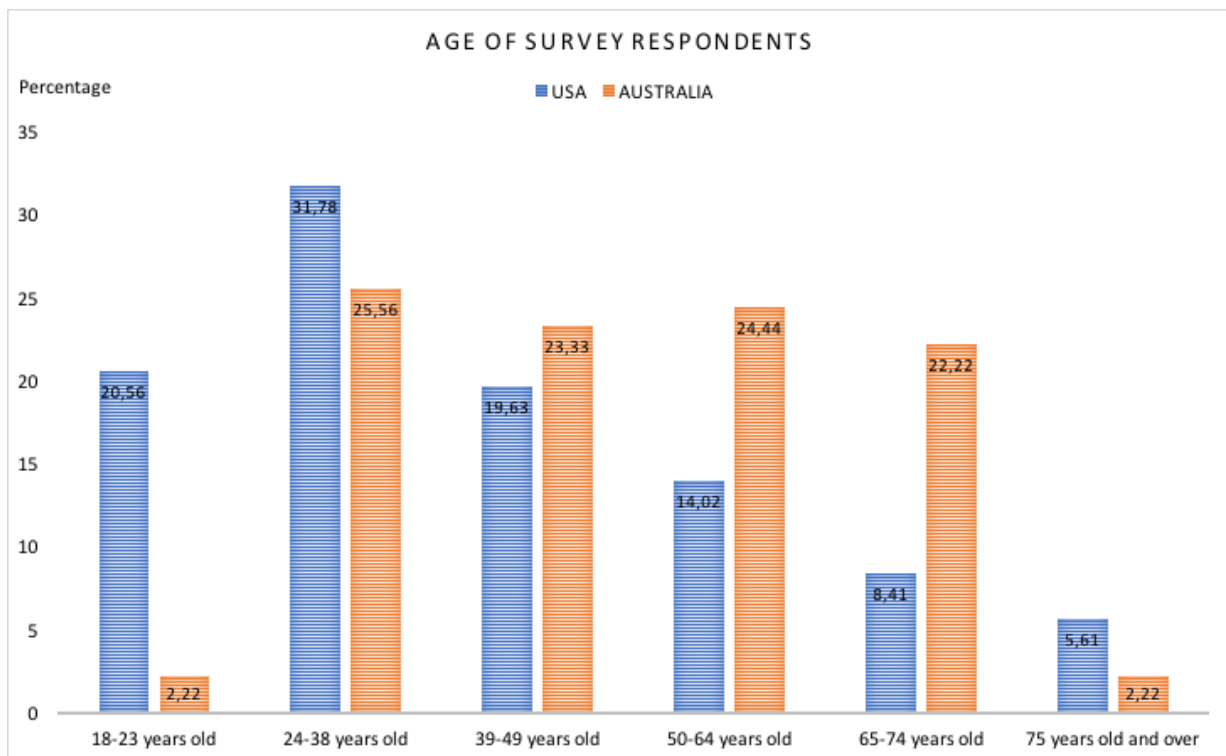


Figure 7.

Age of survey respondents

To further assess the age distribution in the two groups of participants, I also realised a Pearson chi-square test. The test was done to statistically confirm the apparent age distribution differences between Australians and Americans. The results confirm that the proportions between both panels did differ by age categories, $\chi^2(5, N = 197) = 24.76, p < .05$.

Gender

Connecting to nature in the digital age

Respondents were predominantly female. In the US, 73.58% of respondents were women, 22.64% were men and 3.77% identified as other. In Australia, 65.56% were women, 34.44% were men and none identified as other. On average, for both groups, 69.57% were female, 28.54% were male, and 1.89% other. A Pearson chi-square test was performed to assess whether there was a difference in gender distribution between Australia and the US. The result was statistically significant, $\chi^2(2, N = 196) = 6.27, p < .05$. This confirms that gender was not represented in equal proportions in each group of participants.

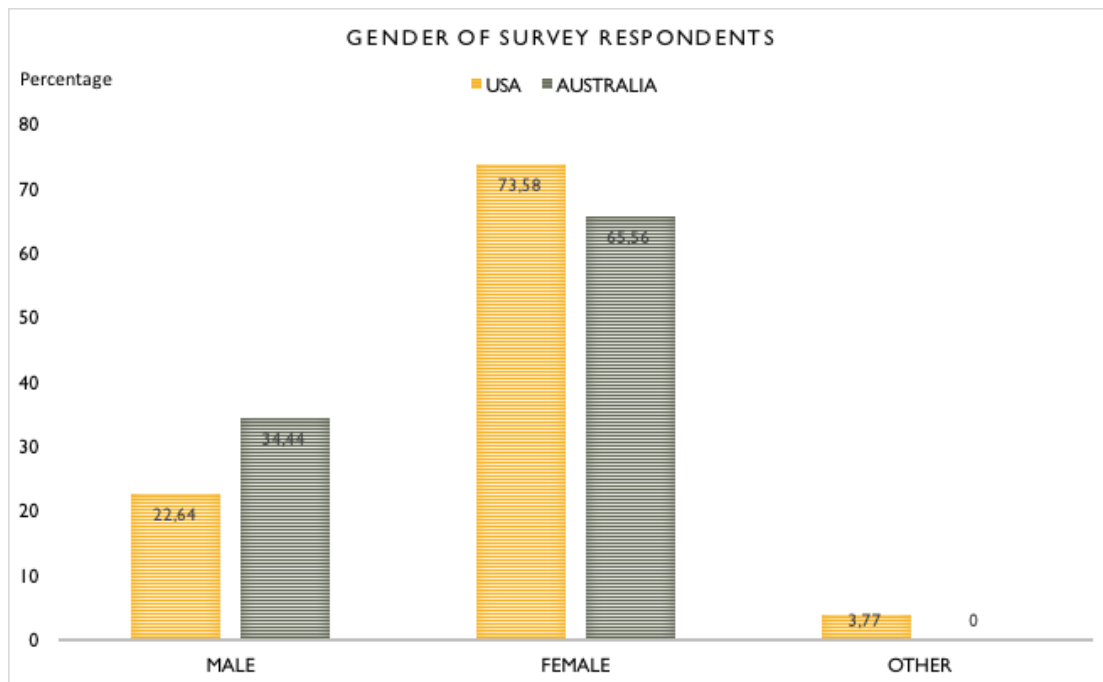


Figure 8.

Gender of survey respondents

No gender quotas were applied for the online survey in order to maximise participation over a short period of time. As I explained in chapter 3 (point 3.3.1.1), an important selection criteria for participants was demonstrating pro-environmental behaviours. I was aware of the bias and greater ease of interviewing women who are generally more responsive to participate (Biernacki and Waldorf, 1981). Chawla (1998) also argues that women are usually more emotionally engaged and show more concern about environmental destruction than men, which may have influenced the survey gender rates. Lehmann (1999) observes that two demographic factors said to influence environmental attitudes and pro-environmental behaviours are gender and education and he argues that pro-environmental individuals are generally female and educated. The longer the education, the more extensive is the knowledge about environmental issues and the willingness to change

them. In this respect, the gender as well as education levels of the respondents confirm the literature on this subject as most respondents were highly educated women (see below for education). The high number of women, although initially unrequested, has become an asset for this study that focuses on beliefs, values, and attitudes towards the environment because emotional involvement is said to be very important in shaping our beliefs about nature (Albrecht, 2019; Chawla, 1998; Milton, 2002). However, the interviews conducted for this study, which have a balanced gender ratio, show that emotional engagement and concern about environmental destruction is not less prevalent in men (see chapter 5, point 5.3.4). The difference between men and women seems to be more an issue of willingness to share one's experience.

Education

Most of the respondents had attained high education levels. 71.96% of American participants went to university (36.45% had a Bachelor Degree and 35.51% a Graduate Degree), and only 1.87% achieved less than high school degree. In Australia, 64.44% went to university (31.11% had a Bachelor Degree and 33.33% a Graduate Degree), and 3.33% achieved less than high school degree. Gender differences in education accord with Lehmann's argument (1999) that men are somewhat less educated than women. In the US, 83.33% of men went to university, over half (58.33%) completed a Graduate or Bachelor degree, and the rest dropped out. 8.33% of men had less than a high school degree. Alternatively, 92.20% of American women went to university and 76.62% graduated (38.96% had a Graduate Degree and 37.66% a Bachelor Degree). No woman had less than a high school degree. Findings in Australia are similar. 75.86% of Australian men went to university, over half (58.62%) completed a Graduate or Bachelor degree and the rest left with no degree. A minority of 6.89% had less than a high school degree. Conversely, 90.90% of Australian women went to university and 70.45% graduated from a Graduate or Bachelor Degree. 4.54% had less than a high school degree. Likewise, a chi-square test was performed to determine whether the education levels differed between Australia and the US. To assess the distribution of education levels between each group of participants, I proposed the following hypotheses:

- The null hypothesis (Ho): There is no significant difference in education levels between Australians and Americans.

- The alternative hypothesis (Ha): There is a significant difference in education levels between Australians and Americans.

The P-value of 4.13 indicates that there is not enough evidence to reject Ho, $\chi^2 (5, N = 197) = 4.13$, $p > .05$. There is no significant difference in education levels between Australians and Americans.

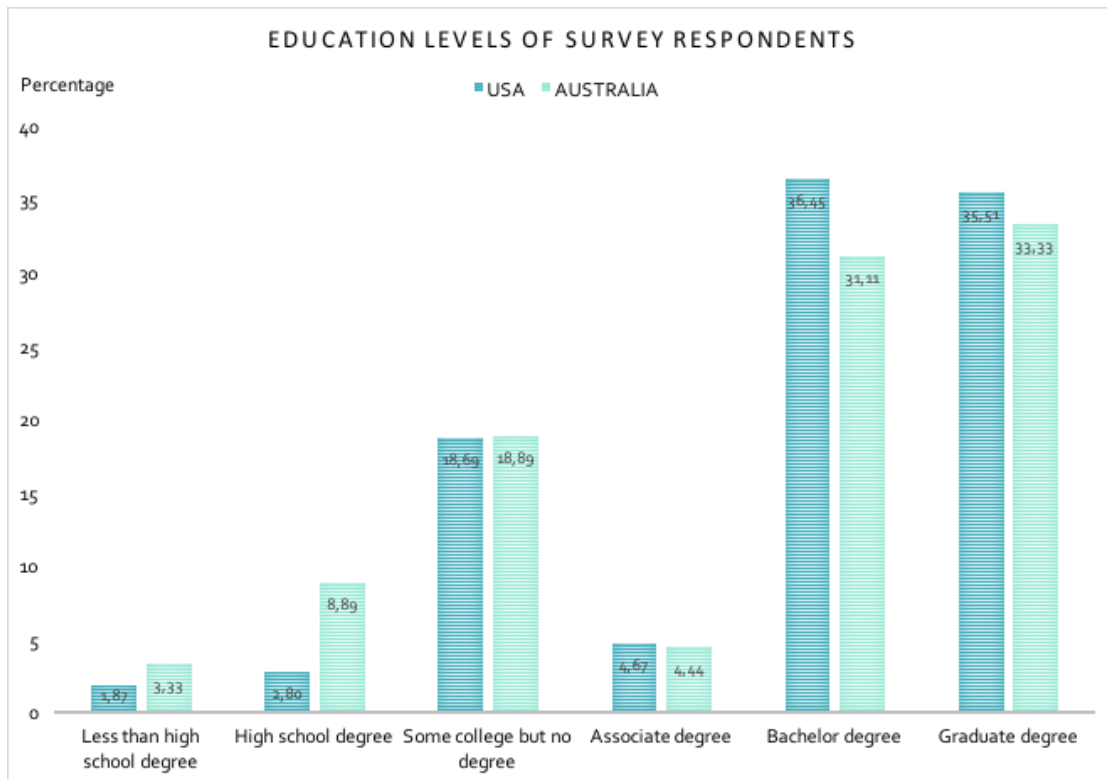


Figure 9.
Education levels of survey respondents

Annual household income

Multiple choice answers to the survey questions on annual household income were in US dollars for the American survey and in AU dollars for the Australian survey. Although they do not equate to the same amount of money depending on the currency, income categories were kept the same in both countries as they relevantly expressed the financial realities of each country. Rate exchange at the time of the survey means that US\$1 equates about AU\$1.5 and AU\$1 equates about US\$0.7. The tables in Appendix E present conversions of each currency according to the survey’s respective income categories. All income levels were represented in both countries. According to the US Census, US average annual income reached US\$52,146 (about AU\$75,807) in January 2019 (Bureau of US Census, 2019). Only 8.74% of American respondents were in the US\$50,000-US\$59,999 bracket. The categories US\$0 to US\$29,999, and from US\$40,000 to US\$49,000 were the most represented (10.68% for each bracket), followed by US\$100,000 to US\$149,999 (11.65%). In a word, about half of American respondents (49.52%) earned less than the average household income and the other half (50.48%) earned the average income or more. According to the Australian Bureau of Statistics (2018), the average annual income in Australia for 2018 was AU\$82,436 (about US\$56,713). A majority of Australian respondents (67.45%) earned less than

Connecting to nature in the digital age

the average household income and 32.55% earned the average annual income or more. Only 6.98% were in the AU\$80,000 to AU\$89,000 bracket. The highest percentage (17.44%) represented respondents who earned between AU\$70,000 and AU\$79,999. While 10.68% of Americans were in the lowest bracket (\$0-\$9,999), in Australia, it only concerned 3.49%.

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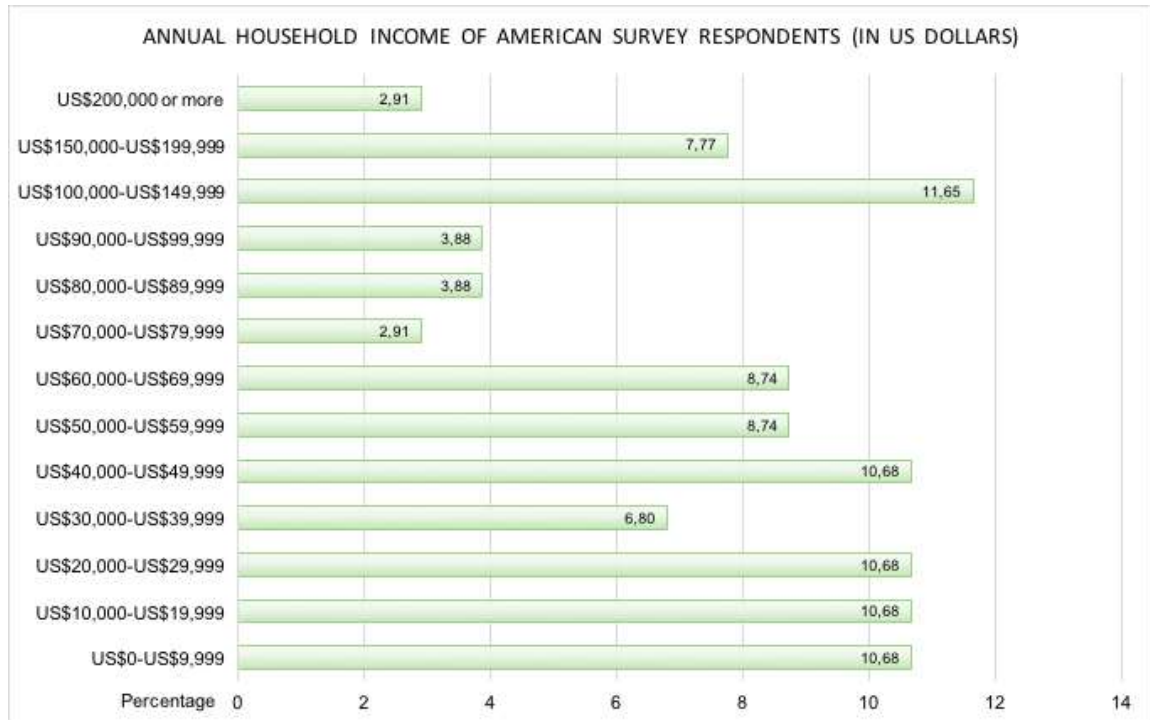


Figure 10.

Annual household income of American respondents

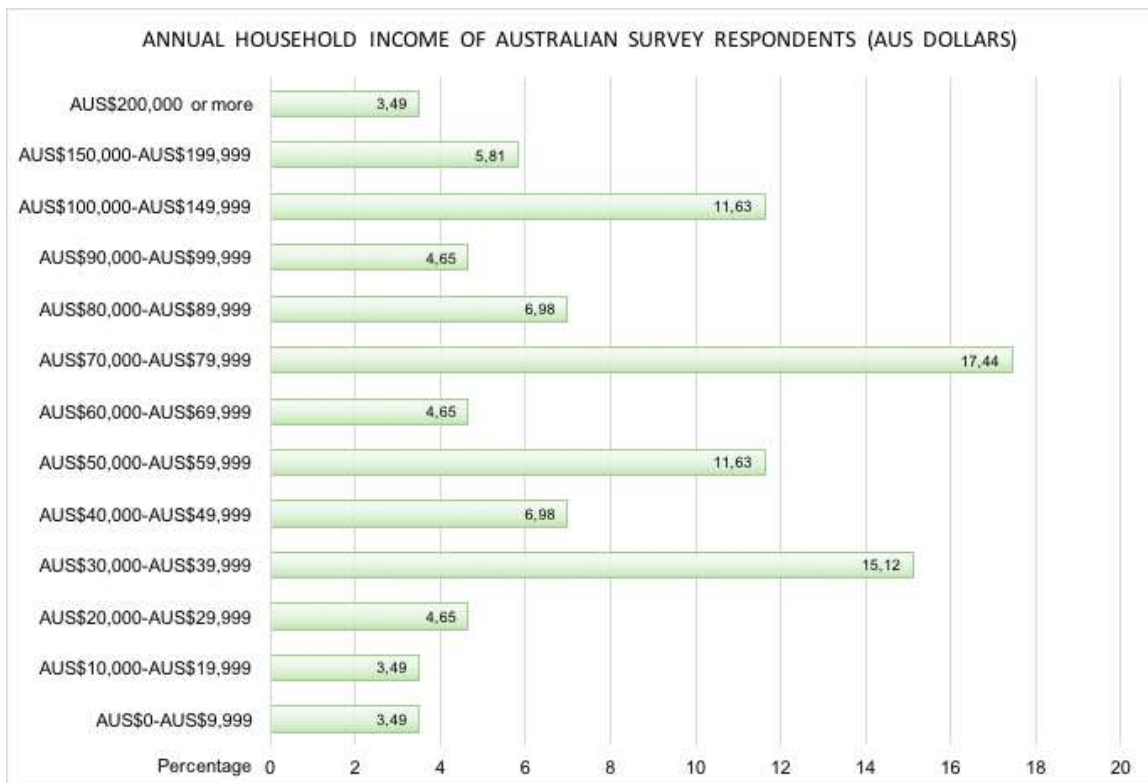


Figure 11.

Annual household income of Australian respondents

Table 3.
Demographic characteristics of American and Australian respondents

Demographics	United States		Australia	
	N	%	N	%
Gender				
Male	24	22.64	31	34.44
Female	78	73.58	59	65.56
Other	4	3.77	0	0
<i>Total</i>	106	100	90	100
Age				
18-23	22	20.56	2	2.22
24-38	34	31.78	23	25.56
39-49	21	19.63	21	23.33
50-64	15	14.02	22	24.44
65-74	9	8.41	20	22.22
75+	6	5.61	2	2.22
<i>Total</i>	107	100	90	100
Education				
Less than high school	2	1.87	3	3.33
High school degree	3	2.80	8	8.89
Some college but no degree	20	18.69	17	18.89
Associate degree	5	4.67	4	4.44
Bachelor degree	39	36.45	28	31.11
Graduate degree	38	35.51	30	33.33
<i>Total</i>	107	100	90	100
Annual household income				
\$0-\$9,999	11	10.68	3	3.49
\$10,000-\$19,999	11	10.68	3	3.49
\$20,000-\$29,999	11	10.68	4	4.65
\$30,000-\$39,999	7	6.80	13	15.12
\$40,000-\$49,999	11	10.68	6	6.98
\$50,000-\$59,999	9	8.74	10	11.63
\$60,000-\$69,999	9	8.74	4	4.65
\$70,000-\$79,999	3	2.91	15	17.44
\$80,000-\$89,999	4	3.88	6	6.98
\$90,000-\$99,999	4	3.88	4	4.65
\$100,000-\$149,999	12	11.65	10	11.63
\$150,000-\$199,999	8	7.77	5	5.81
\$200,000 or more	3	2.91	3	3.49
<i>Total</i>	103	100	86	100

Life experiences leading to attitudinal change

Survey question 10 and survey question 11 of the survey were part of the introductory part that collected demographic and background information on the respondents. SQ 10 asked if there was a particular moment or event that made the respondent change to a more environmentally friendly lifestyle. A majority of participants answered no (US: 62.86% - AUS: 67.42%). The closed question was followed by a comment box for further explanation. The results of the comment box played an important part in defining the theme on education and generational transmittance toward eco-consciousness. They will be detailed along with the qualitative findings in the next chapter. SQ 11 asked when they had started sharing their experience about green lifestyle online. More than the beginning date, which is directly linked to the advent and the normalisation of the smartphone device and of social media in everyday life, it is interesting to note that 73.13% in the US and 66.07% in Australia used the Internet to share their experience and spread a green message.

4.4. Nature beliefs

All participants completed a series of scaled items and multiple-choice questions to measure the variables of interest in this study. After the demographics, the second section of the survey focused on beliefs and values about nature and the third and last section of the survey, which will be discussed later, focused on digital technology usage. I discuss all measures following the survey categories and survey questions.

In SQ 12, respondents were given the definition of wilderness that is mentioned in the American Wilderness Act of 1962 (“an area where the earth and its community of life are untrammelled by man, where man himself is a visitor who does not remain”). They were asked whether they agreed or whether they disagreed with this definition. The Likert-scale offered five possible answers: Agree, Strongly agree, Disagree, Strongly disagree, Neither agree nor disagree. As far as descriptive statistics are concerned, a majority in both countries found the definition accurate (US: 62.19% - AUS: 70.51%), which means that an average of 66.35% agreed to the definition (this includes the Agree and Strongly agree results). In the US, the highest percentage was for the *agree* answer (41.46%) and the lowest for *strongly disagree* (4.88%). Additionally, 20.73% strongly agreed, 19.51% disagreed and 13.41% neither agreed nor disagreed. In Australia, the highest percentage was for the *agree* answer (50%) and the lowest for *strongly disagree* (3.85%). Then 20.51% strongly agreed, 17.95% neither agreed nor disagreed, and 7.69% disagreed. Overall, combining the Disagree and Strongly disagree figures, while 24.39% of

Connecting to nature in the digital age

Americans disagree, only 11.54% of Australians did and views appear less contrasted in the US as the comparative chart below shows.

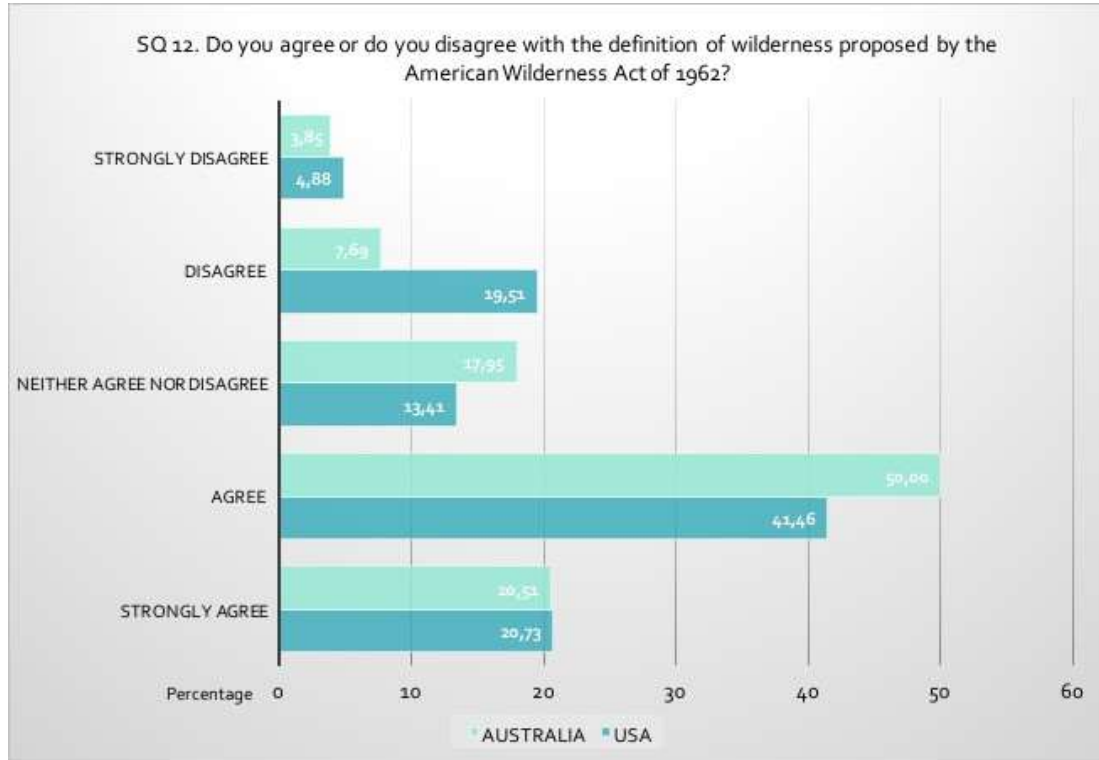


Figure 12.

SQ 12. Do you agree or do you disagree on the definition of wilderness proposed by the American Wilderness Act of 1962?

In order to analyse the data of SQ 12 further, a chi-square test was performed to determine whether there was a correlation between the country of origin (USA or Australia) and one's perception of wilderness. I proposed the following hypotheses:

- The null hypothesis (Ho): There is no relationship between the country of origin (USA or Australia) and one's perception of wilderness.
- The alternative hypothesis (Ha): There is a relationship between the country of origin (USA or Australia) and one's perception of wilderness.

The results of the chi-square test fail to reject Ho, $\chi^2(4, N = 160) = 5.32, p > .05$. This means that there is no significant relationship between the country of origin and one's perception of wilderness.

SQ 14 was designed to focus on the potential origins of pro-environmental behaviours. It asked whether their upbringing had played a role in the participants' connection to nature. A vast majority of participants (US: 86.59% - AUS: 82.89%) explained that it had helped them nurture a relationship with nature. SQ 14 will be correlated with the results from SQ 10 to develop the Environmental education theme in chapter 5 (point 5.3.3). Conversely, 13.41% of Americans and 17.11% of Australians said that their upbringing did not play a role. I also realised a chi-square to test the null hypothesis (H_0) that there was no significant correlation between the country of origin and a pro-environmental upbringing. The results of the chi-square confirmed H_0 , $\chi^2(1, N = 158) = 0.41, p > .05$. A comment box followed SQ 14 for further explanation. The answers will be detailed in the next chapter. The next survey question (SQ 15) presented the concept of solastalgia. Solastalgia describes the distress people experience when a home and its landscapes are negatively impacted by urban transformation, pollution, road works, tree cutting, etc. It also describes a yearning for nature, common to Western societies as screen time is winning over green time (Albrecht, 2005, 2010, 2012, 2019; Albrecht, Sartore, Connor and Higginbotham, 2007; Higginbotham, Connor, Albrecht, Freeman and Agho, 2006). Participants were asked if they had ever experienced solastalgia. The Likert-scale offered five possible answers: A great deal, A lot, Moderately, A little, Not at all. On average, 95.54% of respondents had experienced solastalgia at various degrees (US: 93.75% - AUS: 97.33%). Conversely, only 6.25% of Americans and 2.67% of Australians had no experience of solastalgia at all. Additionally, a Pearson chi-square statistical test was performed to assess the relationship between the country of origin and the predominance of a feeling of solastalgia. The results show that there was no significant relationship between the two variables, $\chi^2(4, N = 155) = 2.71, p > .05$. A comment box followed that question as well to allow respondents to share specific experiences on this subject, the results of which will be detailed in chapter 5.

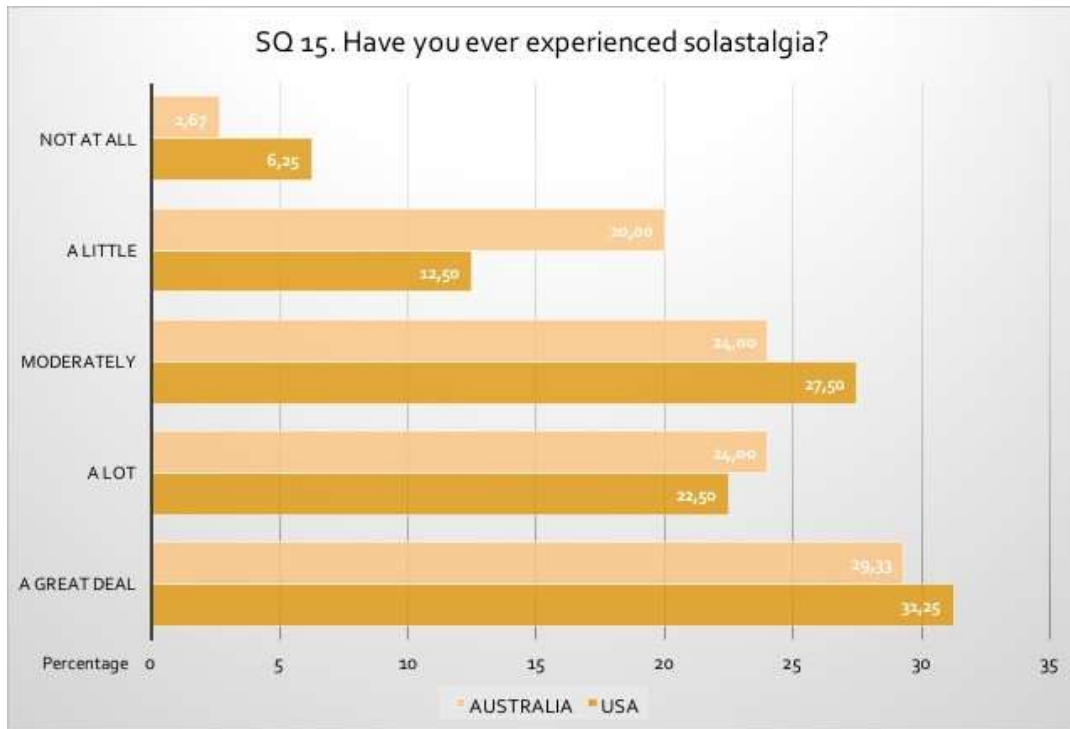


Figure 13.

SQ 15. Have you ever experienced solastalgia?

In SQ 16, participants were asked whether they saw themselves as being separate from nature or as being part of nature. The Likert-scale offered six possible answers: Completely part of nature, Mostly part of nature, Slightly part of nature, Completely separate from nature, Mostly separate from nature, Slightly separate from nature. In the US, 86.42% defined themselves as part of nature (40.74% as mostly part of nature, 24.69% as completely and 20.99% as slightly). It was not until analysing the findings for this question that I started seeing differences between Australia and the United States, and that the comparative study started to get some depth. I have created several pie charts and diagrams of the results to illustrate an essential point that will be developed in the Discussion chapters (chapters 6, 7 and 8). In Australia, 82.9% defined themselves as part of nature. While the majority of Americans defining themselves as mostly part of nature (40.74%), the percentage is lower for Australians (34.21%). The general tendency for both groups appears to be similar (see the comparative diagram below), yet it is in the details that the comparative study becomes interesting.

Connecting to nature in the digital age

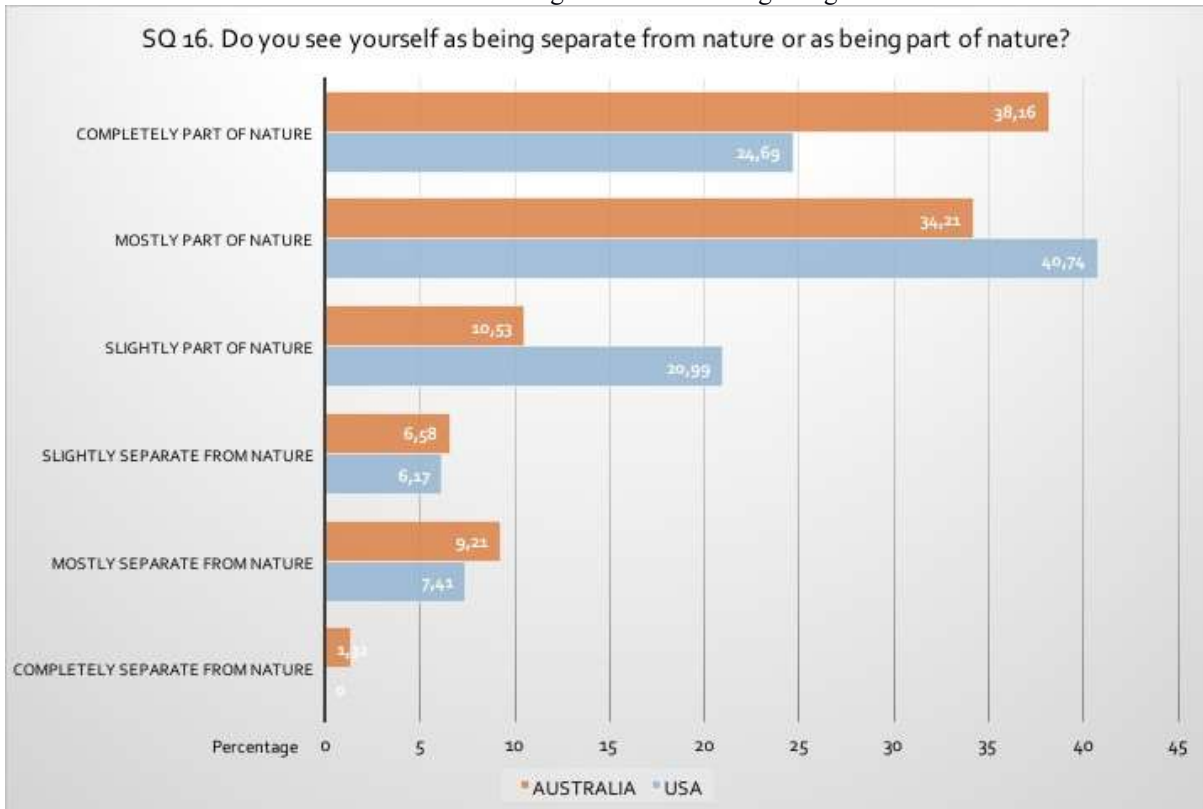


Figure 14.

SQ 16. Do you see yourself as being separate from nature or as being part of nature?

The main difference between both groups shows in the extremes, and in the number of individuals who defined themselves as completely part of nature and completely separate from nature. While 24.69% of Americans saw themselves as completely part of nature, 38.16% of Australians did. This was the highest response category for Australia. Australian respondents seem to relate more intensely to nature whether they considered themselves part of it or separate from it. Only Australian respondents have identified as completely separate from nature (1.32%), none of the Americans did. And overall, 17.11% of Australians saw themselves as separate from nature (including the *mostly*, *slightly*, and *completely separate* categories) whereas 13.58% of American respondents did. The results presented as pie charts effectively convey these differences. They show how, when respondents define themselves as part of nature, the Australian findings involve more individuals in the ‘completely part of nature’ than there are for the American findings. However, I also performed a Pearson chi-square test to assess whether there was an association between the country of origin and defining oneself as part of or separate from nature. The results were not statistically significant, $\chi^2(5, N = 157) = 6.65, p > .05$. This means that there is no correlation between the country of origin and defining oneself as part of or separate from nature.

Connecting to nature in the digital age

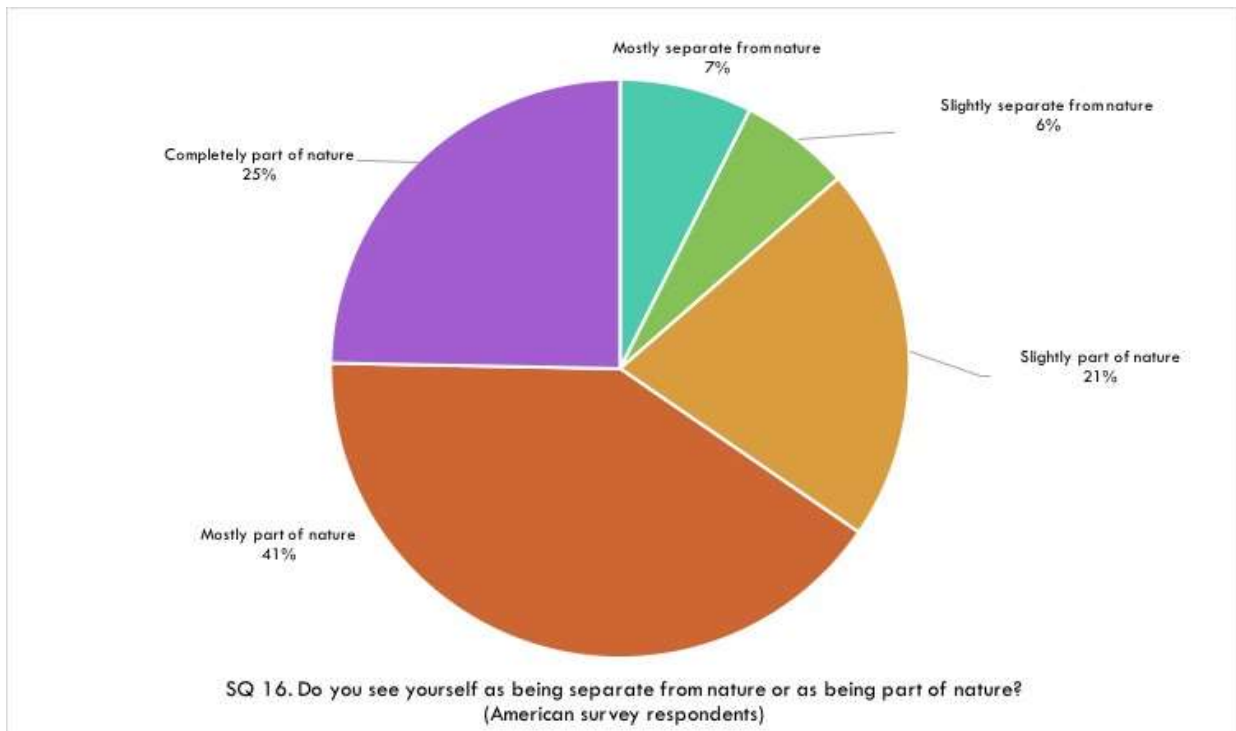


Figure 15.
American respondents on being separate from or part of nature

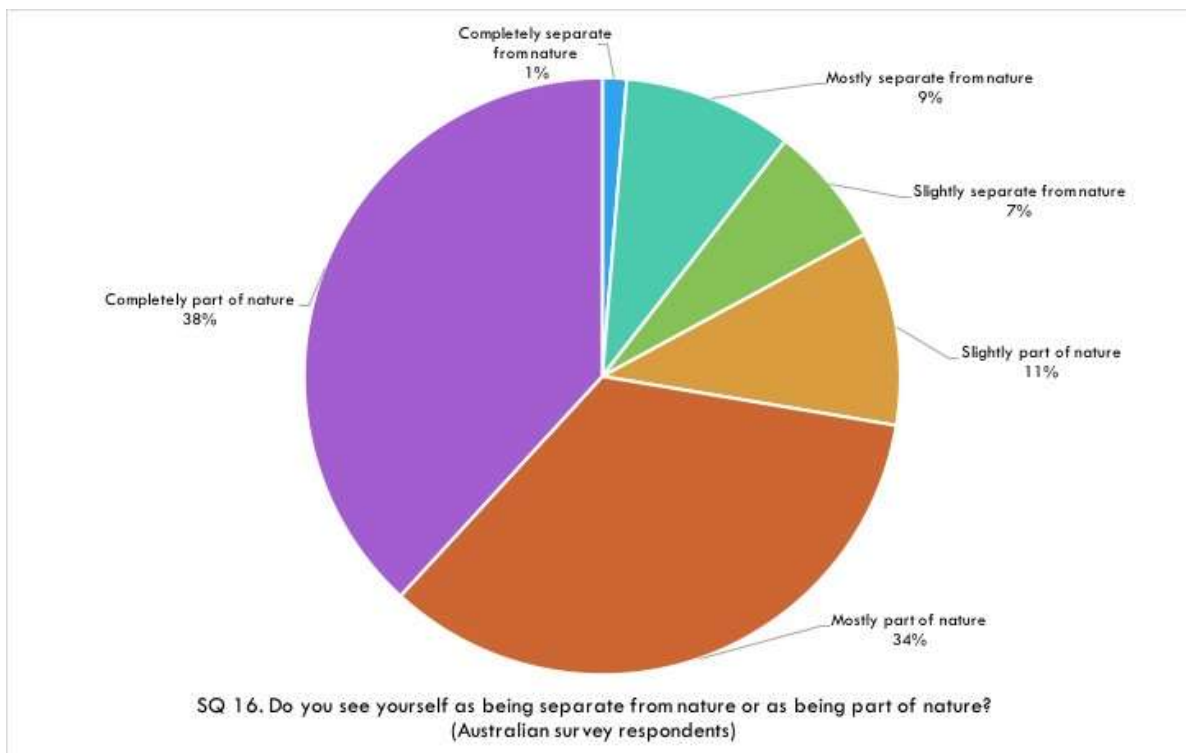


Figure 16.
Australian respondents on being separate from or part of nature

SQ 17 – designed like SQ 12 to test cultural assumptions on nature – asked respondents if they consider humans’ modern creations (such as plastic, electricity, cars, smartphones, etc.) to be part of nature. On average, 78.75% of participants answered no (US: 77.50% - AUS: 80%). Conversely, 22.50% of Americans and 20% of Australian see human creations as part of nature. Additionally, a chi-square test shows no correlation between the country of origin and viewing modern human creations as part of or separate from nature. The results were not statistically significant, $\chi^2(1, N = 155) = 0.14, p > .05$. This question was followed by a comment box where respondents were asked to explain their answer, the findings of which will be explained with the qualitative chapter.

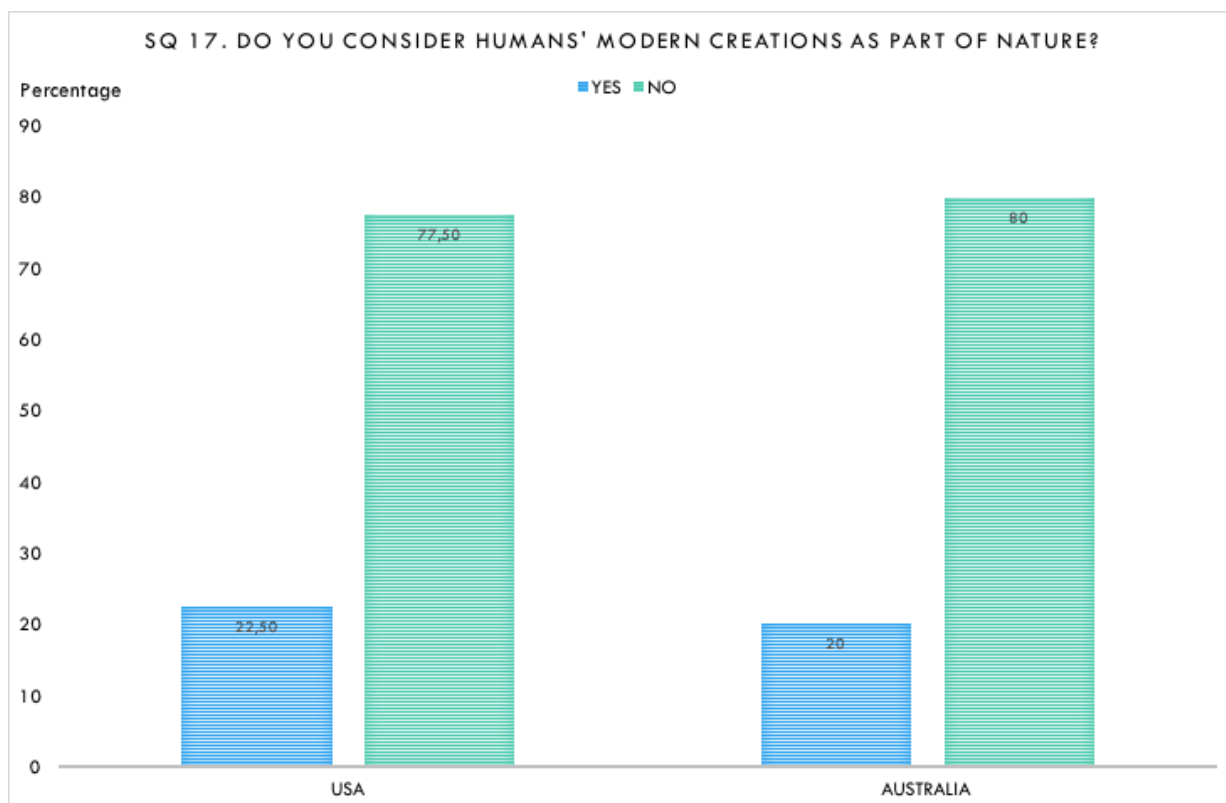


Figure 17.

SQ 17. Do you consider humans’ modern creations as part of nature?

Ecofeminism is a movement that sees parallels between the oppression of nature and the oppression of women. These parallels include, but are not limited to, seeing women and nature as property, and acknowledging that men dominate women, and humans dominate nature (D’Eaubonne, 1974; Plumwood, 1993). In SQ 19, respondents were asked if they identified as ecofeminists. Over half of all participants (54.13%) said that they identified as ecofeminists (this includes US: 55.56% and AUS: 52.70%). Alternatively, 44.44% of Americans and 47.30% of Australians did not consider themselves ecofeminists. Given that survey respondents were mostly female and that ecofeminism is a gender-based theory, I proceeded to examine the results based

on each gender. I wanted to see the real implications of ecofeminist theories in environmental beliefs regardless of gender bias. Even though men also define themselves as feminists (see SQ 20 below) and as ecofeminists, generally more women do. Interestingly, in the US, ecofeminists were predominantly male. Indeed, 64.70% of American men considered themselves ecofeminists, and only 54.23% of American women did. On the contrary, in Australia, ecofeminists were predominantly female (57.44%), with still 42.30% of Australian men identifying as ecofeminists. The next survey question (SQ 20) was designed to complement SQ 19. Respondents were asked whether they considered themselves ecologists, activists, feminists, ecofeminists, none of the above, and other. They were allowed to tick as many boxes as desired. The figure below shows the results for both groups. Additionally, a chi-square test was performed to assess potential association between the country of origin and how the participants defined themselves. The results show that there was no significant association between the variables, $\chi^2(5, N = 157) = 8.91, p > .05$.

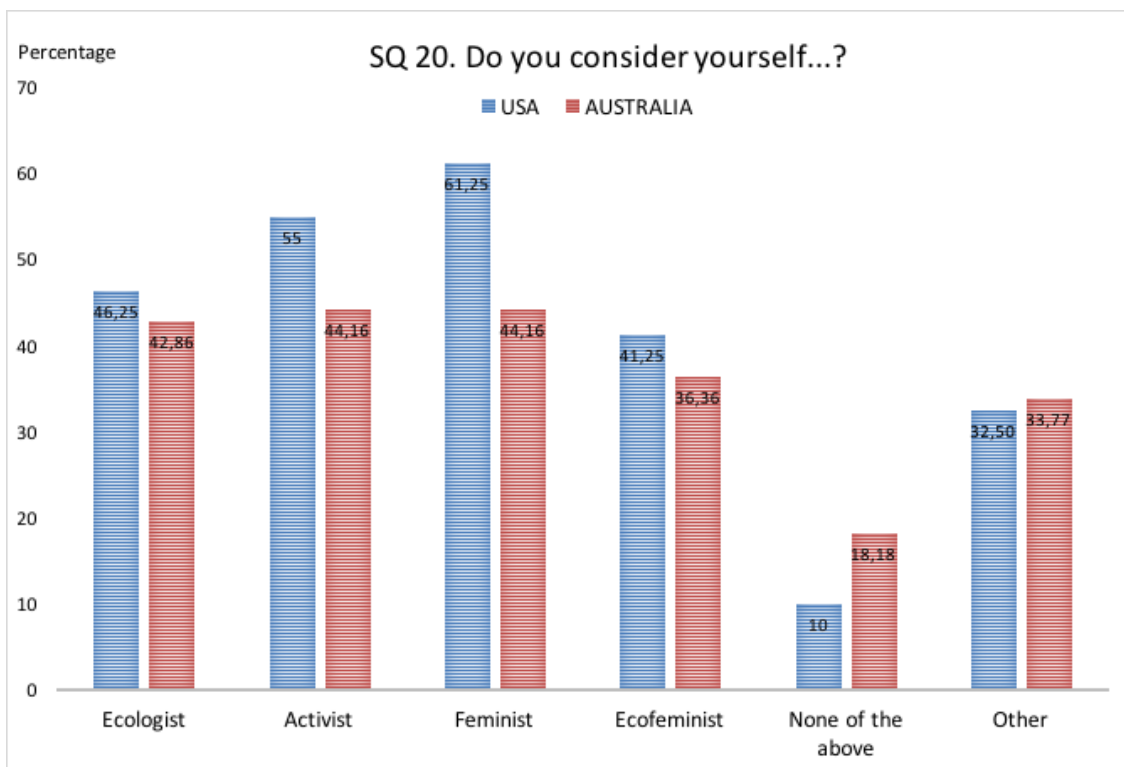


Figure 18.

Respondents on how they defined themselves

SQ 21 presented the concept of human/nature dualism. The human/nature dualism is a prevalent concept in Western society that describes human and nature as being separate and distinct (Callicott and Nelson, 1998; Cronon, 1995). For instance, we often believe that city and nature are opposite, or that humans are

Connecting to nature in the digital age

superior to plants. Participants were asked whether they thought that there was any truth to the concept of human/nature dualism. Findings were very similar in both countries. On average, a majority replied no (64.46%). Indeed, 66.25% of Americans and 62.67% of Australians disagreed with the concept. This also meant that 33.75% of Americans and 37.33% of Australians who agreed with it. In order to analyse the data of SQ 21 further, a chi-square test was performed to determine whether there was a correlation between the country of origin (USA or Australia) and one's acceptance of a human/nature dualism. I proposed the following hypotheses:

- The null hypothesis (Ho): There is no relationship between the country of origin and one's acceptance of a human/nature dualism.
- The alternative hypothesis (Ha): There is a relationship between the country of origin and one's acceptance of a human/nature dualism.

The results of the chi-square test reject the null hypothesis, $\chi^2(1, N = 155) = 18.93, p < .05$. This means that there is a significant relationship between the country of origin and one's acceptance of a human/nature dualism. As I explained in the methodology (chapter 3 – point 3.4.1), the limitation of the chi-square is that if the test shows that there is an association between variables, that does not mean that there is a causality. The chi-square test does not prove that being from an Australian or American culture plays a role in one's view of nature as separate from human or of humans as part of nature. It simply means that both are related. SQ 21 was also followed by a comment box for further explanation.

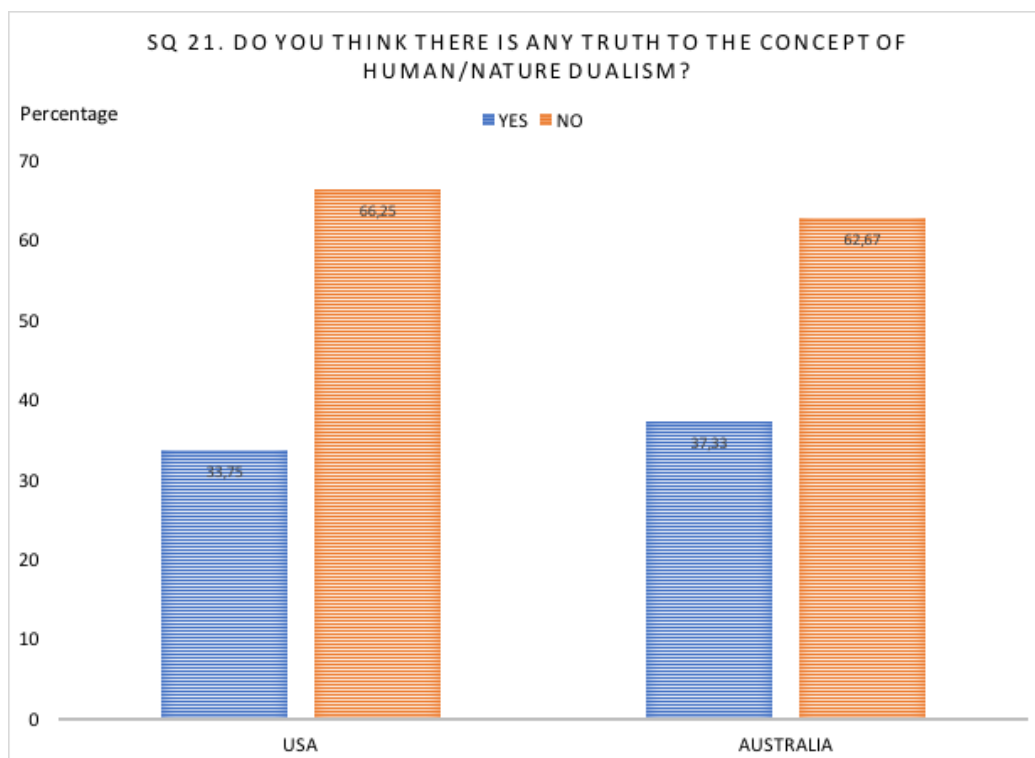


Figure 19.

SQ 21. Do you think there is any truth to the concept of human/nature dualism?

4.5. Internet habits and beliefs

The third and last part of the survey was designed to understand participants' Internet usage and habits and to ask complementary questions about their beliefs and views on nature in a digital context. The majority of all participants (39.69%) reported spending between 2 and 5 hours every day online (US: 46.91% - AUS: 32.47%). A high proportion in Australia spent 2 hours or less (44.16%), almost double the American rate (27.16%). More precisely, 24.68% of Australians spent 1 to 2 hours online and 19.48% spent one hour or less. In the US, 13.58% spent 1 to 2 hours online and the same amount, 13.58%, spent one hour or less. Contrary to assumptions around older generations being less technology proficient, the survey shows that, in the US, the persons who used the Internet the least were between 18 and 49 (61.90% connecting 2 hours or less daily). And, still in the US, 20% of the respondents age 50 to beyond 75 spend from 5 to more than 8 hours on the Internet, with one of the oldest respondents of the survey (75+) spending more than 8 hours online every day. A chi-square test shows that there was no significant correlation between the country of origin and the time spent daily on the Internet, $\chi^2(4, N = 158) = 5.88, p > .05$.

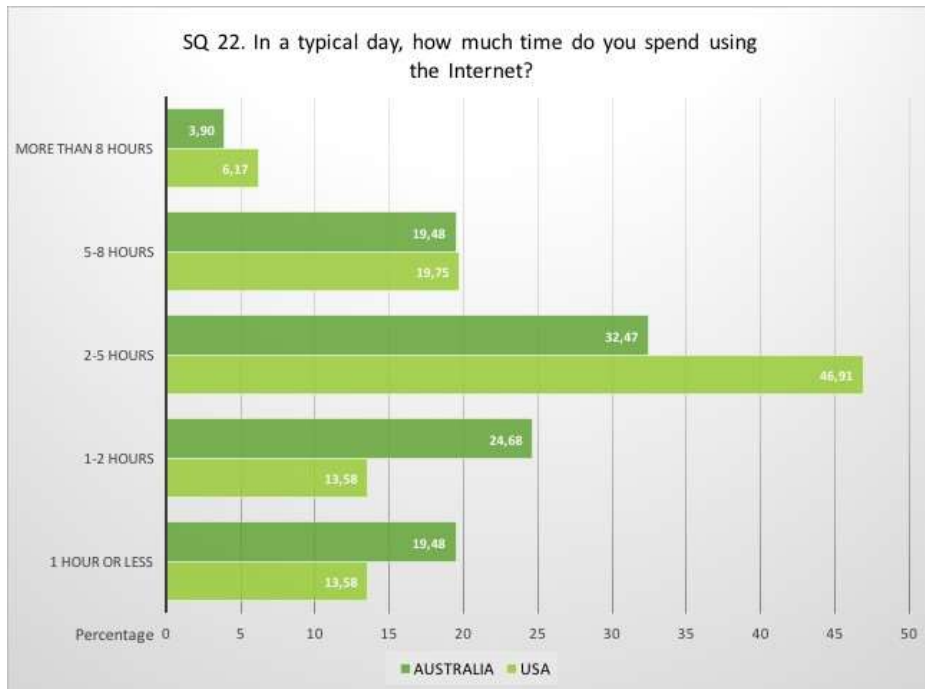


Figure 20.

SQ 22. In a typical day, how much time do you spend using the Internet?

Connecting to nature in the digital age

SQ 23 asked about how often the respondents checked their emails offering 5 possible answers: Never, Rarely, Sometimes, Often, Constantly. A majority of respondents in both groups reported checking their emails often (US: 60% - AUS: 46.75%).

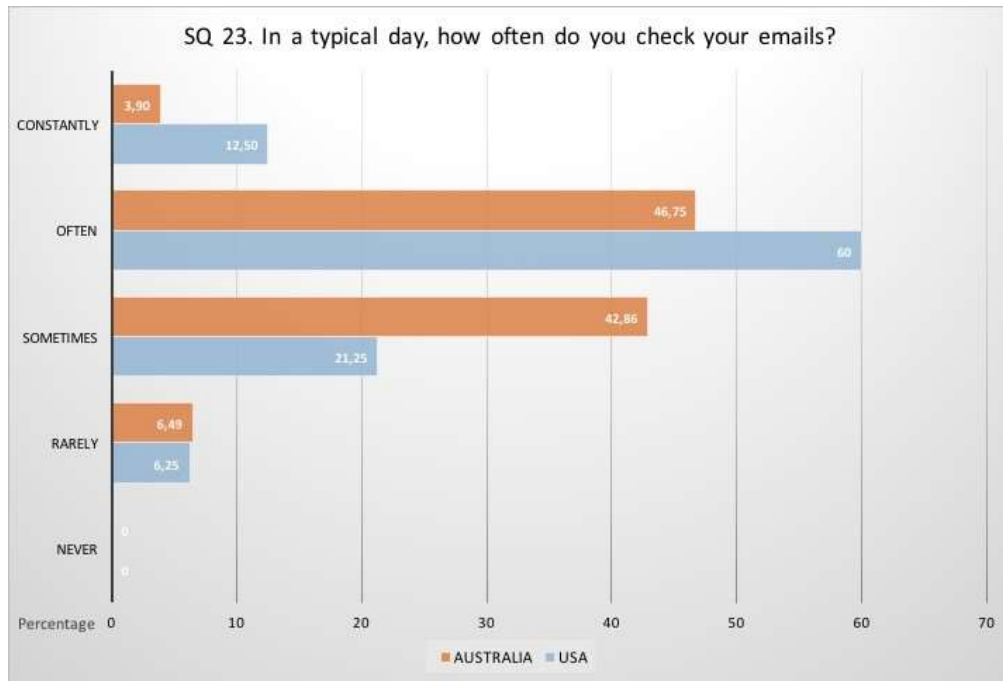


Figure 21.

SQ 23. In a typical day, how often do you check your emails?

On the other hand, 6.25% in the US and 6.49% in Australia checked them rarely. The main differences between both countries appear in the *sometimes* and *constantly* rates. While 21.25% in the US sometimes checked their emails, the rate in Australia was 42.86%, almost equivalent to the 46.75% who checked them often. Moreover, while 3.90% of Australians checked their emails constantly, 12.50% of Americans did, which is over three times more. Overall, as for the daily Internet consumption, findings show that Australians were less involved in digital technology and less connected than Americans. That being said, less connected does not mean disconnected since all participants reported checking their emails at some point. A Pearson chi-square statistical test of independence was performed to assess the relationship between the country of origin and the frequency of emails checking. The results show that there was a relationship between the two variables, $\chi^2(4, N = 157) = 10.55, p < .05$. SQ 24 was about social media habits. As explained in point 4.3, most respondents used the Internet to promote eco-friendly lifestyles and many created websites to that effect. Social media (e.g., Facebook, Twitter, Instagram, Snapchat, etc.) can be used as public or private accounts and, while it is often used to promote green lifestyles, it is also used, on a personal level, to connect to friends and families.

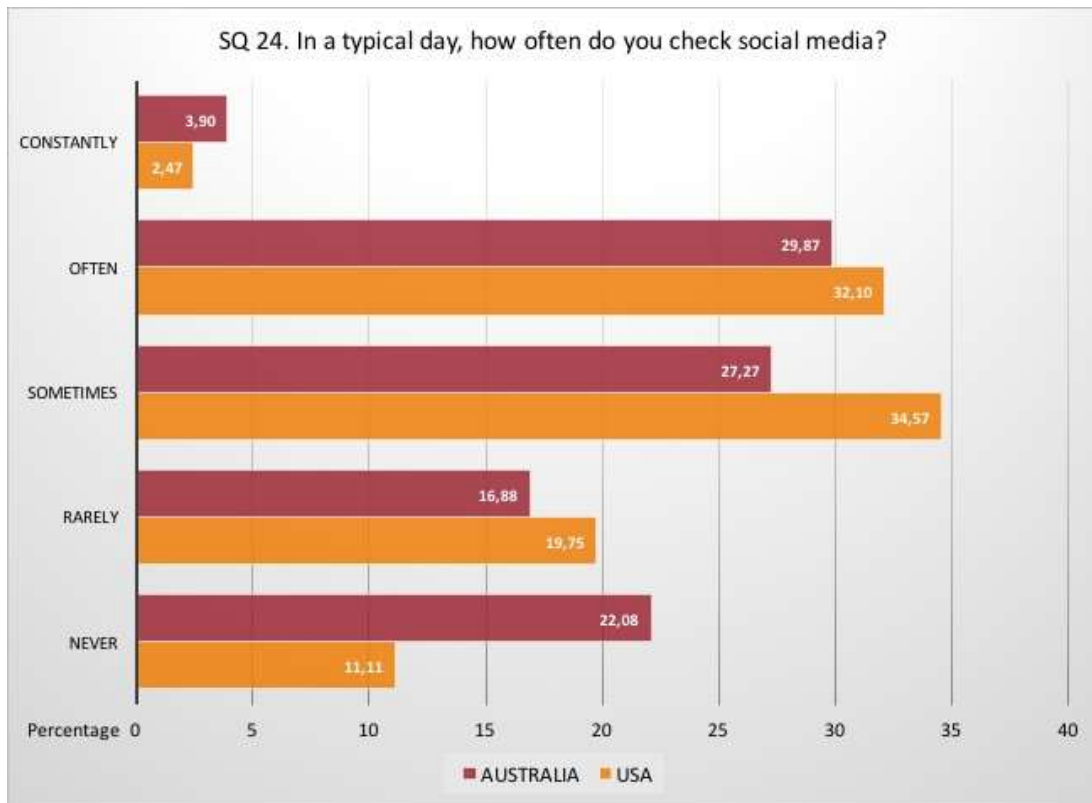


Figure 22.

SQ 24. In a typical day, how often do you check social media?

In the US, most respondents said that they were sometimes checking social media (34.57%) and almost as many replied often (32.10%). Results are quite similar in Australia with 29.87% often checking social media and 27.27% sometimes checking them. While 11.11% of Americans said they were never on social media, double the amount of Australians replied the same (22.08%) confirming a trend toward less connection to digital technology in Australia. Additionally, 19.75% in the US and 16.88% in Australia rarely checked social media. A minority in both countries replied that they were constantly checking (US: 2.47% - AUS: 3.90%). In order to analyse the data of SQ 24 further, a chi-square test was performed to determine whether there was a correlation between the country of origin and the frequency of social media checking. I proposed the following hypotheses:

- The null hypothesis (Ho): There is no relationship between the country of origin and the frequency of social media checking.
- The alternative hypothesis (Ha): There is a relationship between the country of origin and the frequency of social media checking.

Connecting to nature in the digital age

The results of the chi-square test fail to reject H_0 , $\chi^2(4, N = 158) = 4.05, p > .05$. This means that there is no significant relationship between the country of origin and how often one checks social media daily. SQ 25 asked participants whether they periodically unplugged and deliberately took a digital detox. Digital detox is an expression that refers to a period of time when a person voluntarily refrains from using digital devices such as smartphones, computers, and social media platforms (Newport, 2019; Wyatt, Oudshoorn and Pinch, 2013). This form of detoxification has gained popularity as individuals have increased their time spent on digital devices and the Internet. For example, this can mean no digital technology after 7 pm, no connection at all on Sundays, or taking a nature retreat to eliminate dependency among other solutions. Digital detox is linked to digital mindfulness, a theme that will be developed in the qualitative findings (point 5.3.5). The question was not so much asked to know whether respondents practiced digital detox or not, but to understand (via the comment box that followed the closed question) how complicated human-technology relationships can be. In the comment box, participants were asked to share their routine if they practiced digital detox or, if they did not, to explain if that was something that they wanted to do. Results show that 51.25% of Americans and 53.25% of Australians practiced some forms of digital detox. And 48.75% of Americans and 46.75% of Australians did not. SQ 26 asked if respondents experienced feelings of powerlessness due to the increasing prevalence of digital technology in everyday life. However, A chi-square test was performed and it showed that there was no significant association between the country of origin and the habit of digital detox, $\chi^2(1, N = 157) = 0.06, p > .05$. This question is related to the concept of digital solastalgia (point 5.3.6), an expression that I coined myself based on Albrecht's expression of solastalgia (Albrecht, 2005, 2010, 2012, 2019). If solastalgia is defined as the distress experienced when surrounding nature is negatively impacted by urban transformation, I meant digital solastalgia to illustrate the same thing but online. Digital solastalgia refers to the distress experienced when nature is negatively impacted on a global scale and that the information is conveyed via the Internet. This subject will be further developed in the next chapter (point 5.3.5). Results show that 48.10% of Americans and 42.86% of Australians said that they did not experience feelings of powerlessness. The last question of the survey (SQ 27) explained that many researchers think that technology is changing human relationship with nature (Crist, 2013; Greenwood and Stini, 1977). Participants were asked whether digital technology has helped them to have a deeper relationship with nature, or whether it has prevented them from having a deeper relationship with nature.

Connecting to nature in the digital age

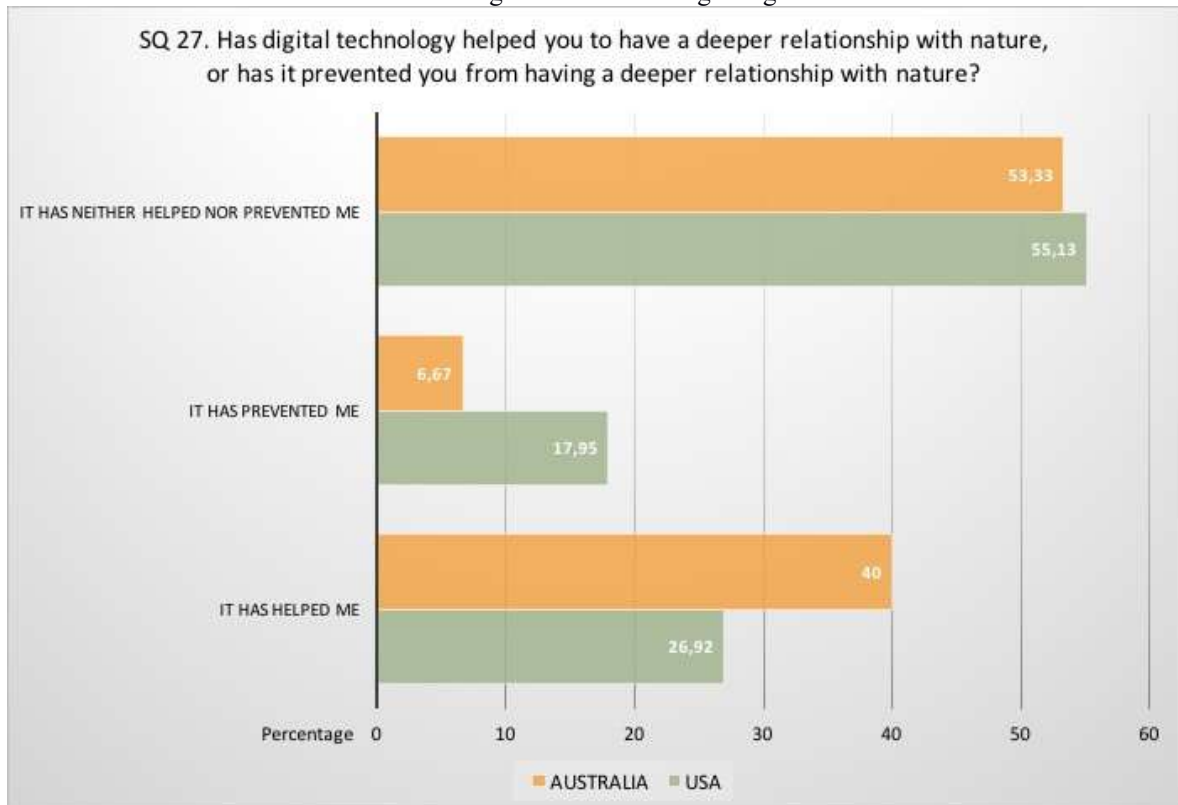


Figure 23.

SQ 27. Has digital technology helped you to have a deeper relationship with nature, or has it prevented you from having a deeper relationship with nature?

In the US, 55.13% replied that it had neither helped nor prevented them, 26.92% that it had helped them, and 17.95% that it had prevented them. Similarly, in Australia, 53.33% replied that it had neither helped nor prevented them. But contrary to the US answers, almost double the amount replied that it had helped them (40%) and triple less that it had prevented them (6.67%). The majority of answers was part of the neither/nor category which may look like a deadend. However, that question was complemented by a comment box to explain the chosen answer. As I will detail in chapter 5 (point 5.3.5), findings from the comment box show that digital technology is, on average, perceived as a positive tool to connect to nature. Additionally, I realised a chi-square test which showed that there was no significant association between the country of origin and whether digital technology helped to have a deeper relationship with nature or prevented from doing so, $\chi^2(2, N = 153) = 5.90, p > .05$.

4.6. Conclusion

Quantitative findings show many similarities between the United States and Australia. They also show differences. As far as demographic characteristics are concerned, both groups of survey

Connecting to nature in the digital age

respondents predominantly live in urban and suburban areas. They are predominantly female with high levels of education. Millennials tend to be more represented in the American respondents, while age categories are more equally represented in the Australian respondents. Overall, annual household income findings show that a wide range of incomes is present in both groups, and that the Australian participants are somewhat richer than the American participants. As far as the participants' views of nature are concerned, Australians appear generally more connected to nature, and as SQ 13 shows, they identify more strongly with nature than the Americans. Their answers to such questions as SQ 12 on the wilderness definition are somewhat more contrasted than the Americans' answers, and less critical of the Wilderness Act definition. Both groups see humans' modern creations as unnatural and refuse the concept of human/nature dualism in the same proportions. On average, Americans report experiencing solastalgia in a stronger way than Australians. There are more participants in the US who define themselves as feminists and activists, and there are more participants in Australia who did not want to label themselves according to the options proposed in SQ 20. As far as their digital habits and beliefs are concerned, results point toward a tighter connection to digital technology in the US than in Australia. This may be related to the findings of SQ 27 on digital technology as helping or preventing nature connection, in which Americans also report more negative sentiment towards digital technology. The main trend that I observe from the quantitative survey findings is the prevalence of screen time over nature time in the US, and a reversed tendency in Australia where nature connection appears more important than online connection. I will develop on this trend in the Discussion chapters (chapters 6, 7 and 8).

5. Qualitative findings

5.1. Introduction

The qualitative data for this study was collected via an online survey and interviews with a sample of survey respondents. The survey questionnaire had six open-ended questions and eight comment boxes following close-ended questions, the results of which I present in this chapter. The interviews were conducted with a number of interviewees (n=20) that was smaller than the number of survey respondents (n=220), which is usual in follow-up interviews (Gill, Stewart, Treasure and Chadwick, 2008). The collection of the qualitative data had the aim to help explain the quantitative data and add depth and richness to it.

5.2. Demographic characteristics of the interviewees

The demographic characteristics for the survey respondents have been detailed in the previous chapter (see point 4.3). I will detail here the demographic characteristics of the persons who were interviewed. The interviewees were selected from three criteria:

- (1) Survey respondents' willingness to be interviewed (this was limited by the number of persons who shared their contact details at the end of the survey to be interviewed)
- (2) Demographic characteristics (gender, age, location, income)
- (3) Conceptual characteristics (based on the person's answers)

In the US, 71% of the survey respondents (58 individuals) agreed to a follow-up interview. In Australia, 72% of the survey respondents (56 individuals) agreed to a follow-up interview. Given the high amount of women who responded to the survey, I aimed for an equal number of men and women in the interviewees. I also wanted all age categories to be represented and geographical locations as well as incomes to be as diverse as possible. As a result, 20 individuals, including 10 Americans and 10 Australians, were selected. The interviews were conducted face-to-face (in person or via Skype), over the phone and in a written format. The tables below present the demographic characteristics of the American and Australian interviewees.

Table 4.
Demographic characteristics of the American interviewees

USA						
	<i>Gender</i>	<i>Age</i>	<i>Occupation</i>	<i>Education</i>	<i>Annual Income (US dollars)</i>	<i>Location</i>
1.	Female	24-38	Farmer	Graduate degree	\$0-\$9,999	Vermont
2.	Female	24-38	Business owner	Associate degree	\$30,000-\$39,999	Wisconsin
3.	Female	50-64	Massage therapist	Bachelor degree	\$10,000-\$19,999	Vermont
4.	Female	65-74	Retired	Graduate degree	\$40,000-\$49,999	Vermont
5.	Male	18-23	Teacher/student	Some college but no degree	\$150,000-199,999	Michigan
6.	Male	24-38	Communard	Graduate degree	\$0-\$9,999	Virginia
7.	Male	24-38	Artist/student	Bachelor degree	\$50,000-\$59,999	Vermont
8.	Male	39-49	Farmer	Less than high school degree	\$100,000-\$149,999	California
9.	Male	50-64	Poet	Some college but no degree	\$10,000-\$19,999	Wisconsin
10.	Male	65-74	Nurse	Graduate degree	\$150,000-199,999	North Carolina

Table 5.
Demographic characteristics of the Australian interviewees

AUSTRALIA						
	<i>Gender</i>	<i>Age</i>	<i>Occupation</i>	<i>Education</i>	<i>Annual Income (AU dollars)</i>	<i>Location</i>
1.	Female	24-38	Student	Graduate degree	\$200,000 or more	Queensland
2.	Female	39-49	Community education officer	Bachelor degree	\$100,000-\$149,999	Western Australia
3.	Female	39-49	Student	Graduate degree	\$30,000-\$39,999	Queensland
4.	Female	50-64	Retired	Graduate degree	\$10,000-\$19,999	Queensland
5.	Male	24-38	Writer	Graduate degree	\$60,000-\$69,999	Victoria
6.	Male	24-38	Care assistant	Graduate degree	\$80,000-\$89,999	Tasmania
7.	Male	24-38	Paramedic	Bachelor degree	\$100,000-\$149,999	South Australia
8.	Male	39-49	Environmental activist	Graduate degree	\$70,000-\$79,999	New South Wales
9.	Male	65-74	Software developer	High school degree	\$70,000-\$79,999	New South Wales
10.	Male	65-74	Teacher	Graduate degree	\$100,000-\$149,999	South Australia

5.3. Themes

The qualitative findings are presented as themes based on the survey and interview data. The coding process was inductive, or data-driven (Boyatzis, 1998; Braun and Clarke, 2006). This means that the identification of meaning was based on the data and not predetermined theory and concepts. Each of the themes originates from the answers of the participants and will be illustrated with quotations from the survey and the interviews. I found six recurring themes: connectedness to nature, nature as other, environmental education, ecological emotions, digital mindfulness, and digital solastalgia. Connectedness to nature relates to the way human beings perceive themselves as intrinsically part of the natural environment, and how they extend their own identity to it. This trait is common to pro-environmental individuals although some tend to see nature as separate from humans. This is my second theme, nature as other, which explains how predominant cultural beliefs still convey a view of nature as estranged from human beings. Environmental education depicts the different tools involved in developing nature awareness (i.e. family, exposure to nature, media and school). The theme on ecological emotions presents the emotional discourse related to how human beings view nature in the current ecological crisis. This discourse is loaded with feelings such as guilt, grief, anxiety or anger. These emotions are important as they can be in contradiction with the intellectual reasoning regarding the environmental situation, and these contradictions, as I will argue in the Discussion chapters (chapters 6, 7 and 8), show an evolution in our environmental identity. Then, the theme on digital mindfulness explains how nature connectedness in a digital context is helpful in creating a more balanced, relaxed and intentional use of digital technology. Finally, the theme on digital solastalgia conveys the distress experienced by participants when hearing about ecological issues online and the disconnecting aspect of technology in the human-nature relation.

As Braun and Clarke (2019) explain, prevalence or recurrence is not the most important criteria in determining what constitutes a theme. Themes can be considered important if they are highly relevant to the research question and significant in understanding the phenomena of interest. Yet, the prevalence of each theme remains interesting in order to understand the dominant beliefs and to pinpoint differences and similarities between the US and Australia. I want to stress that each theme presented here was clearly apparent in both countries, and that there was no thematic gap between the US and Australia. The only difference between both countries was the degree of recurrence of these themes. Cultural beliefs on nature are increasingly shaped by global influences, and in a way they tend to harmonise. Ideas spread faster with the Internet and they know no geographical boundaries. Yet, I found clear

differences between the American group and the Australian group. These differences show that in the face of a globalised culture, situational actions and habits are essential, and this will be discussed in the Discussion chapters. For now, and to contextualise the findings, I have also included diagrams to illustrate the prevalence of the themes and provide the reader with a bigger picture.

5.3.1. Connectedness to nature

Connectedness to nature is described by Mayer and Frantz (2004), Schultz (2002) and Lieflander, Frohlich, Bogner and Schultz (2013) as the extent to which individuals include nature as part of their identity. Connectedness to nature is also related to the concept of environmental identity developed by Clayton (2003), which can be defined as a sense of identity that transcends the individual and encompasses one's position as part of a living ecosystem. Other concepts and measures have also been developed to assess the human-nature relationship and one's subjective connection to nature. They include commitment to nature (Davis, Green and Reed, 2009), connectivity with nature (Dutcher, Finley, Luloff and Buttolph Johnson, 2007), emotional affinity toward nature (Kals, Schumacher and Montada, 1999), and nature relatedness (Nisbet, Zelenski and Murphy, 2008). Schultz (2002) references three components making up nature connectedness – also called inclusion of nature in self: (1) the cognitive component, which refers to how integrated one feels with nature, (2) the affective component, which is one's sense of care for nature, and (3) the behavioural component, which is an individual's commitment to protect the natural environment. Nature connectedness represents an all-encompassing understanding of nature and everything that it is made up of, even the parts that are not pleasing as the participants' quotations will illustrate. Many survey and interview questions dealt with Western cultural binaries on nature, participants' reactions to these questions was to see the whole behind the separation and, instead of talking about duality, to talk about their connection to the environment. Survey questions 10, 12, 13, 14, 17, 18, 21 and 27, and interview questions 1 to 6 helped me define this theme. As many respondents shared, developing a connection to nature involved understanding the individual's connection to the rest of humankind, and also to the whole of life in a spiritual manner.

Participants acknowledge their connection to nature, talking not about humans but about “human animals”, they see themselves as part of the intrinsic network of living things. The notion of human animal has been developed As an Australian participant states “We are all

nature. Nature is everything on this planet”, or, nature is “Our living environment, the connectedness of all things, plants, animals and the landscape” (AUS), it is “Anything natural, which can be humans, plants, animals, ecosystems, bacteria, etc” (US). Some even wonder how it is possible to see oneself as separate from nature: “I find myself wondering how people are able to even for moment consider themselves being not a part of nature: like, ‘you are currently converting a sandwich, which is made of other species, into *your body*’” (US). Human connection to nature was a subject that I wanted to develop with the interviews. What does it mean to be part of nature? How does one know one is part of nature? Is it more of a feeling or more of an intellectual process? As often with dichotomised questions, the answer is it is both. Some individuals may start with developing their intellectual understanding of nature, some may favour spending time in nature to physically feel this connection. As I will develop in the discussion chapters (chapters 6, 7 and 8), the mind/body dualism is increasingly being replaced by a mindbody connection (Benson, 2015; Kabat-Zinn, 2013). Many participants confirm that their relation to nature is an all-encompassing experience including the intellect, the senses and the emotions. In this respect, seeing mind and body as a whole (mindbody), and not as segmented part making up an individual, is linked to perceiving human and nature as a whole (humanature). It plays a role in debunking the human/nature binary since cultural binaries are all intertwined and simply reveal the dualistic worldview inherent to Western culture. An Australian science teacher shares how he came to see his connection to nature:

Strangely, the next strong event in my considering myself being connected to nature was when I saw the similarity between hemoglobin and chlorophyll molecules. Up until that realization, I had a kind of superficial sense of being part of nature. That my blood had the same molecular form as the green of trees was a revolution in thinking.

Mind and body work together to help comprehension. Similarly, an American farmer shares the following experience:

I see how nature provides my ability to live, and the longer I am involved in farming, the more I see myself as part of the network of the forest, or the soil. Particularly with soil: I was sitting in a workshop about soil and my mind was blown when I discovered that soil is not a thing, it is a network of relationships. Not then, but a little later, gradually, I realized that my action upon and dependence on the soil constituted a relationship too, that I was part of the network too.

But intellect and emotions are not always at peace with one another, and many respondents reported feeling torn or confused by conflicting ideas and beliefs. Beliefs, as Frank and

Kuhlmann (2017) argue, are different from ideas and are intimately linked to emotions and revealing of inner values. An Australian student expresses this conflict very well:

Intellectually I know that a division between the natural world and human culture (which can be modern creations) has led to the exploitation and extinction crisis currently happening. By seeing myself as part of nature it then follows that human creations as a whole are also part of nature. This adds conflicting feelings as my intellectual attempt to see myself and human creations as part of nature is in direct conflict with my feelings and beliefs that modern creations and human culture are responsible for a lot of the environmental degradation currently happening.

Even SQ 12 on the definition of wilderness (a definition on which a majority of participants agreed), received many answers expressing interconnection. Wilderness tends to be opposed to cities, but as an American respondent observes “Don’t cities spring up out of wilderness eventually?”. Many questioned the definition of wilderness of the American Wilderness Act, saying it was “outdated”, “archetypal”, “unrealistic” or “lacking nuances”. Some argue that humankind and wilderness are not separate. “Humans are a part of the natural world just like any animal. I think humans can live in wilderness and not take away from the fact that it’s wilderness” (AUS), or “I believe that we are all part of the whole whether in the city or in the wilderness” (US). Just as participants identify with nature, they extend human creations and human modern lifestyle to nature. “A beaver dam is part of nature. It’s the beaver’s habitat. Cities are human habitat. Humans are part of nature. Thus, cities are also nature. The issue isn’t that nature and humans or nature and cities are opposed, but that we think of them as opposed” (US). As an Australian participant points out “Every single thing, manufactured or extracted or transformed or in a ‘natural’ state or harvested, to be used by humans, comes from the earth. We forget this continually”. Questioning human place within nature extends the debate on sustainability. While a majority of respondents assimilates anything ‘unnatural’ to everything that is unsustainable (see point 5.3.2), some view plastic, iPhones and other modern artefacts, however environmentally destructive, as natural.

There isn’t any way to ‘get out’ of nature – plastic and electricity are ontologically continuous with anything any species crafts as part of a reciprocal interaction with one’s environment. Maybe more useful is to think about these things as products of our interaction with other species and the world around us – plastic is a gift from plants and others who died millions of years ago, and it is our entanglement with others, humans and nonhuman, which make any of our human creations possible. (US)

Some participants may sometimes express confusion, but they are willing to question the concept of sustainability.

I agree that all human actions are natural, but not that acting “naturally” is necessarily just. Nature is not necessarily just or sustainable, especially if we (as I do) consider the human species to be part of the greater system of nature. No part of nature, human or otherwise, acts to preserve its own environment or the ecological stability of the world. Nature is not inherently permanent or self-sustaining. (US)

I suppose generally we ARE all (humans and other animates – including plants and even inanimates) relentlessly natural in what we do, and ultimately our world will come to balance in some way as dictated by laws of nature – meaning, for example, humans may self-destruct through climate collapse, etc. But somehow, if we have the capacity to curb our brains and tool use, we might be able to survive – or maybe that’s evolution at work. (US)

Connection to nature is ultimately linked to connection to other living things. Participants growing up in pro-environmental families (see point 5.3.3) nurtured their relation to nature via a connection to other human beings. They see their ties to previous generations (family), present generations (partner, friends) and future generations (children) as playing a role in deepening their connection to nature. As this Australian participant explains:

After having children, I recognized their need for connection with nature and this also reminded me of how much I enjoyed nature as a child – and still did. It helped me to think of our relationship with the environment as mutually nurturing and interdependent.

Another Australian participant shares a similar story: “Mother nurtured me directly. It was a link to the natural processes and allowed a connection with all of the nature that became me. I am not separate from nature”. Some participants observe how nature developed their spirituality. Except for a few persons who came from religious communities and framed their answers using Christian principles, a majority talked about spirituality, instead of religion, as a feeling of connection to something bigger (consciousness, life, universe, etc.). As an Australian respondent observes, “Nature is the whole living community in relationship. I think from the human perspective it is us, other humans and the more than human”, or nature is “Heaven and Earth and everything in between” (US).

I have come to believe that even the machinations of humans are ‘of nature’. Nature entails life. Perhaps nature is consciousness. As in consciousness or presence precedes

matter. You sense nature when you see math, water carving rock, smell flowers, feel animosity, etc. (US)

Connectedness to nature as a theme is complementary with the theme on nature as other in which nature is perceived as different and separate from humankind. Both themes form a whole illustrating the evolving human-nature relation in contemporary Western society.

5.3.2. Nature as other

In the 21st century, Western societies appear more and more separated from nature, notably in urban contexts (Soga and Gaston, 2016). While research increasingly work at bridging the conceptual gap separating the human world and the natural world (Callicott and Nelson, 1998; Kohak, 1984; Merchant, 1980), nature is still perceived as an ‘other’. The popularity of constructs like the environmental identity shows that humans are increasingly defined as part of nature, but this tendency is still minor, and, human activity, if not identity, is often understood as a separate category from other natural phenomena. As I will develop in this theme, participants describe humankind as estranged from nature. Likewise, manufactured objects and human interactions are generally not considered part of nature. The notion of an othering of nature appeared with survey questions 12, 13, 17, 18 and 21 and interview questions 3, 4, 5, and 6. The process of othering means treating another group as essentially different from the group one belongs to, and it can be related to ethnicity, gender, social class, etc. One of the most challenging confrontations of otherness in the current global discourse is between human beings and nature. Many consider alterity as an environmental issue, which opens up a range of unresolved dichotomies (Cronon, 1995; Guha, 1998; Milton, 1996). Yet, it is interesting to note that creating one’s identity is part of the process of othering. In phenomenology, the other is identified in his/her differences from the self, and it is a constituting factor in the self-image of a person (Miller, 2008). As I will explain in this theme, nature is often seen as juxtaposed to human beings. This view is complementary to seeing humans and nature as connected. They may seem like opposite versions of each other yet they are not opposed. As a counterpart, the dualistic vision of nature as Other ultimately relates to the identity of the individual, just as connectedness to nature does. As Hailwood (2000) argues, there also are values in nature’s otherness. Based on the findings from SQ 13 (Can you give your own definition of *nature?*), I was able to establish the prevalence of seeing human and nature as separate over seeing

human and nature as one as the diagram below illustrates. However, a chi-square test of independence shows that there was no significant association between the country of origin and viewing nature as human-exclusive or human-inclusive, $\chi^2(1, N = 152) = 0.87, p > .05$.

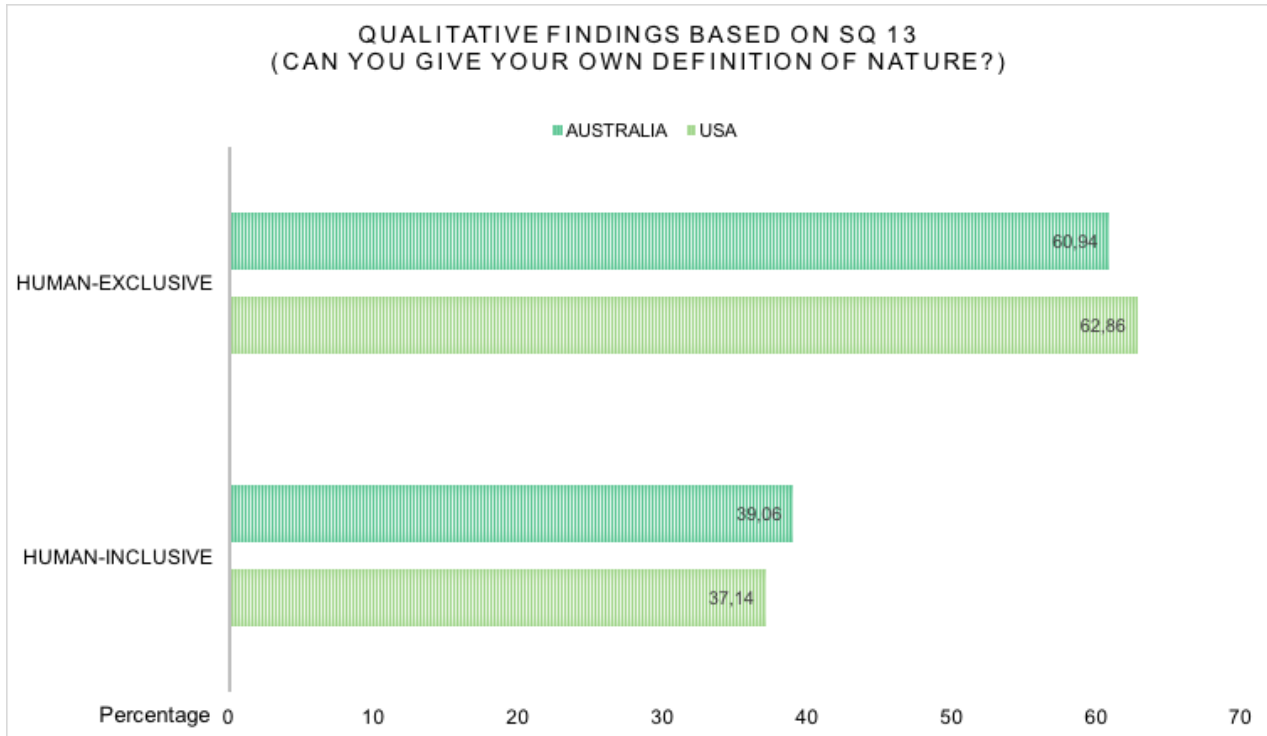


Figure 24. Qualitative findings based on SQ 13 (Can you give your own definition of nature?)

In most debates on otherness, the natural environment features as a normative background, which my findings confirm. Nature is depicted as the scenery on which human activities take place, what Plumwood (1993) calls the “backgrounding” of nature. Nature is “outdoors”, “outside”, “the world around us”, “that which exists outside of human activity”, “an area with 360 degrees of natural vegetation”. Stating that nature is “everything around us” means setting *us* apart as the central witness of nature, living in it yet remaining an outsider. Nature is constantly opposed to human. Nature is seen as “the part of the world that humans didn’t make up themselves” (US). Participants insist that nature is “not synthesised by man” (AUS), “not man-made” (US), “not created by man” (US), or as this American respondent observes, “Nature is a place that humans haven’t fucked up”. The notion of home is also opposed to nature. An

Australian activist argues that the opposition of nature and home comes from a “conscious separation” that is part of Western culture:

It’s not just the home, it’s most elements of our lives – roads, shopping centres, lawns, swimming pools and office towers – the way that humans “claim” the land we inhabit is almost all encompassing. From shark nets to carparks – we push nature away as much as possible. (AUS)

Human creations are seen as “unnatural”. The term *artificial* is used in opposition to *natural* and very often as a synonym for *human* (“Things are either natural or artificial, ie man made” - AUS; “these modern creations are in the realm of the artificial, or not-natural” - US). Participants think that human-made creations separate them further from nature (“They are intrusions upon nature” - AUS; “they disconnect us from nature” - AUS). I came to understand that when respondents use the term *unnatural*, they use it as a synonym for *unsustainable*. “Anything that negatively impacts the natural balance of our environment on a large scale, is not part of nature” (AUS); “No, they are not natural. Their mass and rapid consumption at the cost of the environment is ecocidal” (US); “Something is missing for me to call everything we’ve made natural. When harmoniously connected and mutually beneficial, the word natural feels appropriate” (US).

When I asked participants how they distinguished between nature, wilderness and the bush, their answers reflected anthropocentric views (“the building of infrastructures differentiates them” - US; “it depends on the levels of human impact and population” - AUS; “Nature is the way the world was before humans affected it, wilderness is the parts that have yet to be affected” - US). The following comment by an Australian participant also denotes a human-centred system of values in which the human quality is inversely proportional to the natural quality.

I personally have a scale where I acknowledge things have varying degrees of human influence. e.g. a garden is made up of ‘natural plants’ but the distribution of those plants is designed by humans, so a garden is ‘somewhat natural’. The Wilderness is not designed by humans and is an assortment of naturally distributed plants, so it is ‘mostly natural’, while the bush is a word I use to describe a certain type of ecosystem. In Australia, the bush is used to describe a semi-arid forest.

A majority of participants agree with the definition proposed by the Wilderness Act, a definition that has been criticised for reinforcing the human/nature dualism (Callicott and Nelson, 1998; Cronon, 1995): “It sounds right”, “Obvious”, “Logic”, “Self-explanatory”, “Just makes sense”.

Wilderness and the bush are viewed as “unattainable”, “remote”, and “isolated” while nature is described as more ordinary (“nature is everyday surroundings” - AUS; “It has a closer proximity to man” - US). As an American participant sums it up, “Nature is accessible to everyone. Wilderness is a little more hardcore. Bush is next level”.

Proposing definitions of nature, respondents tend to use an othering language. A lexical field on romantic representations of nature is prevalent in their discourse. Romanticised views of nature have been criticised for perpetuating the human/nature dichotomy as Cronon (1995) and Oelschaleger (1998) argue (see Chapter 2). They talk about “pure”, “true”, “free” nature, “sanctuaries” that are “untouched”, “unaltered” and “untamed”, or as an American participant puts it: “A green refuge, providing peace and tranquility from urban life”. They use words related to the imagination and mental representations. “This definition sounds like it describes wilderness as I imagine it” (AUS), “It creates an image of a natural untouched space that is respected by man” (US); “I guess it’s just different images in my head. Nature encompasses a much broader definition, wilderness conjures images of dense woodland/forest and the bush is more of an outback image” (AUS). I want to stress the role of nature representations in the participants’ dualistic views on nature. As I will develop in the discussion chapters (chapters 6, 7 and 8), research shows that the less one is exposed to nature, the more one tends to romanticise it (Louv, 2012; St Claire, 2017).

The notion of patriarchy, which is prevalent throughout the findings, also plays a role in a dualistic view of nature. Although the *anthro* in *anthropocentrism* refers to all humans rather than exclusively to men, some feminist philosophers argue that the anthropocentric worldview is in fact a patriarchal point of view. Ecofeminists (Daly, 1978; D’Eaubonne, 1974; Guha, 1998; Plumwood 1993) agree on the centrality of dualism in the patriarchal roots of anthropocentrism. They claim that to view nature as inferior to humanity is analogous to viewing women as inferior to white Western men and, as with nature, it provides moral justification for their exploitation. While some respondents comment on the gender bias apparent in SQ 12 (“Too anthropomorphic and male-centered”; “Sure, that makes sense, except I’d like to see it updated to say human instead of man”; “The gender bias doesn’t do it for me”), a majority frame their answers using a gendered discourse. *Man* is often used in place of *human* and nature is often referred to as female. As an example, the following comment, while seemingly feminist, also contains gendered concepts on nature:

Evolved humans (it’s more than a little outdated to use the term “man” to describe all people) can live in harmony with Mother Earth and be part of or even improve the state

of an ecosystem, and therefore live in the “wilderness” without “trammelling”. This statement refers to uneducated “men” (like those who wrote the act). (AUS)

Expressions such as “Mother Earth”, “Mother Nature”, or “Gaia” are linked to a view of nature as female and are male-exclusive. These terms suggest the interdependence of women and nature, while disregarding the interdependence of men and nature, and they reinforce the Western perception of women as prominent actors in domestic chores as well as contributors to environmental conservation (Salleh, 1997). In this respect, nature is considered as antagonist to human beings, as a non-human or “more-than-human” other to quote one of the American participants.

5.3.3. Environmental education

Environmental education is a process that allows individuals to learn about natural environments and how human systems and ecosystems can be managed harmoniously. When environmentally educated, individuals develop an awareness and sensitivity to the environment, a deeper understanding of environmental challenges, and tend to participate in pro-environmental activities (Hudson, 2001; Stapp and Cox, 1969). Environmental education cannot be limited to formal educational institutions since an individual also acquires awareness through his social life and his social relationships. My findings confirm that environmental education can be accomplished through different strategies. Survey questions 10, 14 and 27, and interview question 8 helped me develop this theme. Most participants started nurturing a bond to nature and developing an environmental awareness as children. They report four different tools that effectively helped their environmental education: family, exposure to nature, media, and school. Based on the findings from SQ 10 which asks what made the participants turn to an environmentally-friendly lifestyle, I was able to establish the predominance of each of these educative tool (diagram below). A fifth element is apparent in this diagram. Many participants said that nothing made them change to an environmentally friendly lifestyle and that they always had the “inclination”, “felt called to live that way”, or “have always been aware of nature as a necessity in my life”. This element, which can be related to an instinctual drive towards nature, is an interesting point that I will develop in chapter 7 (point 7.4). A caveat to finish this introduction: I performed a chi-square test of independence which showed that there was no significant associaton between the country of origin and the various facets of environmental education (i.e., family, exposure to nature, media, school, and instinct), $\chi^2(4, N = 110) = 3.65, p > .05$.

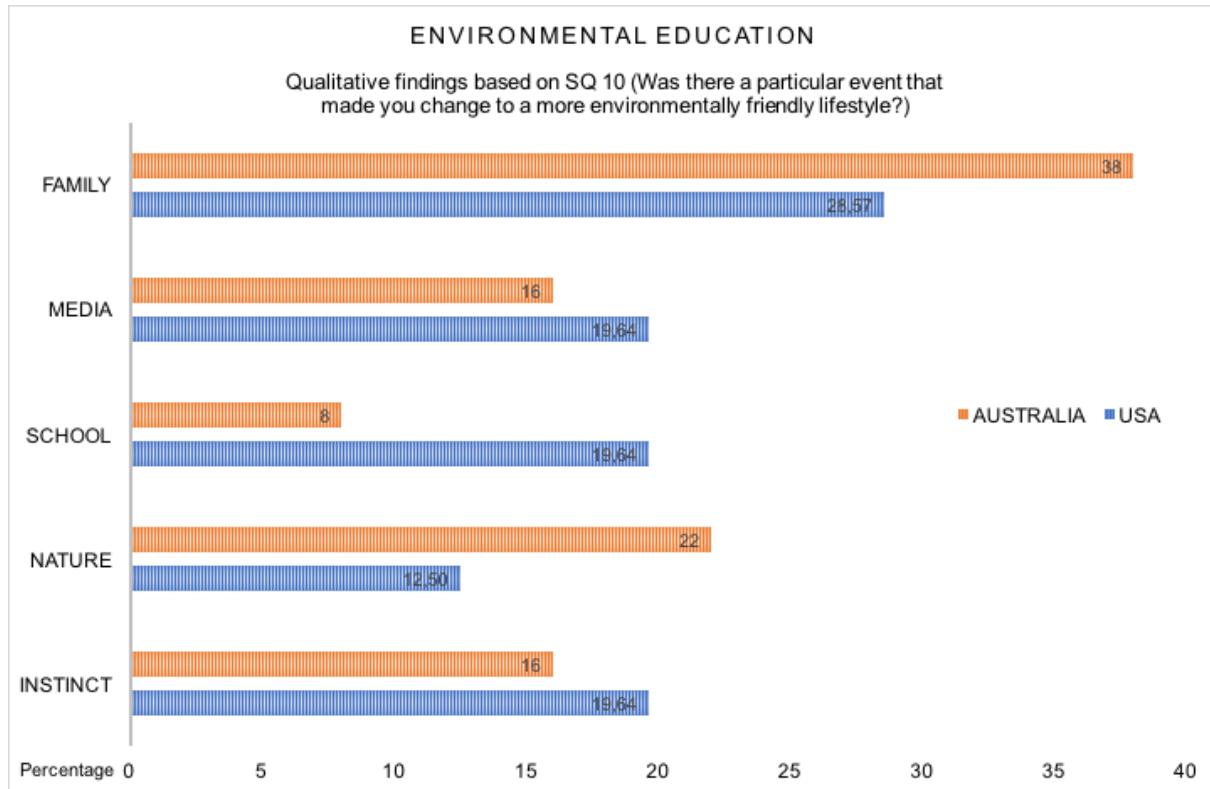


Figure 25.
Qualitative findings based on SQ 10 (Was there a particular event that made you change to a more environmentally friendly lifestyle?)

Family

Green families, as Payne (2005) call them, demonstrate pro-environmental attitudes and practise an environmental ethic at home that the children integrate and tend to replicate in adulthood. Environmental education in green homes is generally associated with the doing of practical things in relation to the everyday environmental problematic and stands for an informal sort of education. This study’s findings show that families initiate environmental awareness by teaching values related to ecology, sustainability, recycling, etc. and by promoting outdoor activities for children (such as gardening, camping, hiking, animal caring, plant learning). Although this dynamic may be more common in families living in rural or semi-rural areas, parents play a determining role even when living in urban areas.

My parents recycled, we lived next to an urban park, they were very conscious of frugality and not spending on things we didn't need. (US)

I grew up in a city and my mother introduced me to planting flowers and naming flowers when I was a young girl and I loved it. She told me I had a 'green thumb' when I said I liked the feeling of dirt on my hands. That small encouragement flourished into a love of gardening. (US)

Respondents report learning ecological values from their parents and grandparents ("My family members valued nature, plants, gardens, and wildlife" - US; "My mum loves conservation, and always fostered an interest for us kids" - AUS). Self-sufficiency was part of their everyday life.

My mother was an avid organic gardener and we ate what she grew. My father loved to fish, and hunt when possible, and we also ate what he brought home. (US)

I come from an immigrant family who brought with them knowledge of making items of use for themselves. They used simple basic materials like wood crates (sturdy at that time) for tables and made dish towels from flour sacs. (US)

And activities such as recycling, composting and gardening were important.

My parents always had compost heaps, chickens, and veggie gardens, so I grew up with an idea about recycling things. [They] were not environmentalists but they did things that made sense. By the time I left home, I was very interested in gardening and having a compost heap myself. (AUS)

Many participants got their first contact with nature in their backyard ("My mom had a garden that I sometimes got to help with, and she showed me how to look at insects and flowers under a microscope" - US; "My house had a big backyard so I could explore the garden and we had animals around including wallabies and lizards" - AUS). But the most important thing that the participants received from their families was an access to nature.

Exposure to nature

Environmental knowledge, which is viewed as a fundamental component of environmental education, does not necessarily result in ecological behaviour (Gifford, 2011). On the other hand, many studies (Corcoran, 1999; Rosa, Profice and Collado, 2018; Tanner, 1980) show that exposure to nature is important in childhood in fostering pro-environmental actions. Indeed, in a recent study, Otto and Pensini (2017) proved that increased participation in nature-based

environmental education in children is related to greater ecological behaviour. Many participants to this study report spending time outside as the most important element in developing their environmental awareness, and stress the importance for children of having “copious amounts of unsupervised outside time learning about living things and how they interact with their environment” (US). “My parents encouraged outdoor recreation, which had a huge impact on this mentality”, another American participant observes. They suggest that physical outdoor activity may be more important than intellectual knowledge on the environment: “We had opportunities to spend time in the backyard, in parks, go camping, go bushwalking, go to the beach, go to national parks. There was no explicit ‘education’ about nature or the environment” (AUS). Participants developed a personal sense of what nature is and who they are in relation to it, and this bond lives on when they reach adulthood.

Growing up, I had opportunities to spend a fair amount of time in natural surroundings. I think one of the most important parts about this time was that I felt that I wasn’t under the surveillance of parents or other authority figures. As a child, I felt that nature was somewhere I could feel free and somewhere where I belonged. Having the opportunity to enjoy nature as it was – unshaped and unruly – was also important in fostering a feeling of connection and a relationship with nature. (AUS)

Time in nature has been shown to contribute to the development of a broad range of cognitive skills, including observation and focus, critical thinking, analysis, problem-solving, and creativity (Berman, Jonides and Kaplan, 2008; Williams, 2017). Many respondents confirm that exposure to nature represent a non-verbal, less traditional, form of education.

I grew up in the heart of the Rocky Mountains. My large family used little of the land and mostly just enjoyed being surrounded by it. We had a modest footprint on our 2 acres. We discovered the beauty by learning about different plants and animals. The mountains taught me many things. (US)

Play in nature kindles a sense of exploration and discovery, and can build children’s enthusiasm and environmental awareness.

I grew up in a small town and spent a lot of time climbing trees and playing outside in the neighborhood, picking berries in the nature reserve, and doing nature-related field trips with my school classes. I loved the idea of being a naturalist, and I loved being allowed to explore and play outside and discover the plants and animals that lived close to me. (US)

Nature is also important for mental health. Research (Engemann, Pedersen, Arge, Tsirogiannis, Mortensen and Svenning, 2019) shows that children who spend time in nature are less likely to develop psychiatric disorders as adults. This is true regardless of age as this Australian participant states:

I was living in Sydney city for many years and found I was slipping into a deep depression. I stayed depressed for many years. I tried many different medications and remedies. I decided to take a holiday to Cairns to get away from the city for two weeks. Within a week of bush walking, visiting the reef and experiencing the beautiful waters around Cairns, my depression disappeared. Nine years later I'm still here in Cairns and very happy.

Beyond the mental and physical benefits of spending time outside, exposure to nature provides a sense of belonging that is related to one's own sense of self and that no other experience of nature (media, school, etc.) can provide. "The more you interact with nature in person the more you realise that you are just a part of nature, not separate from it. Once you have that feeling there is no forgetting again" (AUS).

Childhood is a determining time. The living surroundings, whether rural or urban, one grew up in tend to be replicated in the adult age, as this example illustrates: "I've lived in cities my whole life, and am very happy with the city lifestyle. I would not say I have a bad relationship with nature, I like to go hiking/camping/explore nature but very much as a hobby. In my daily life, I would much prefer to be surrounded by the busyness of city life than nature" (AUS). The increasing predominance of urbanity makes nature exposure during childhood even more relevant.

Media

Media play a role in environmental education. Visual supports are said to be beneficial to developing perspective-taking and critical thinking abilities leading to a more pro-environmental disposition (Bahk, 2010; Barbas, Paraskevopoulos and Stamou, 2009). The participants report learning ecological values and even having "life-changing moments" thanks to the media (i.e. TV, cinema, press and books). Many watched documentaries, series or films ("I watched the documentary 'An Inconvenient Truth' when I was 10-11 years old." - US; "The 'War on Waste' series on ABC TV several years ago... how much we generate landfill and the amount of plastic in the oceans." - AUS; "Mostly watching documentaries and shorts like The

Story of Stuff.” - US). An American participant explains how a news report about the treatment of ‘downed’ dairy cows was instrumental in fostering a greater level of environmental sensitivity:

These cows were too sick to stand but by law, cattle need to stand and walk to their slaughter. These cows were sprayed with fire hoses and hit with fork lifts to get them up so they could be killed and put into our food system. I am not okay with eating sick animals and I am definitely not okay with severely abusing them in the process. This sparked looking into our food system much closer and learning that I can do it better myself.

Other participants turned to an environmentally friendly lifestyle thanks to something they read (“A water conservation article” - US; “I read Naomi Klein’s ‘This Changes Everything: Climate Change vs Capitalism.’ Before that, being environmentally aware was something I cared about, but that book changed me and greatly widened my perspective” - US). This American participant turned to a zero-waste lifestyle after reading about plastic pollution in the ocean:

I didn’t want to be a part of this. This desire led to examining all aspects of my life - because plastic is involved in all aspects of life – and making big changes that turned out to be beneficial not only to the environment but also to me.

In today’s society, a lot of reading and watching is done online where information and ideas spread faster than in traditional media, which is why the Internet as a tool for pro-environmental development is a category in itself (see point 5.3.5).

School

It is often observed that individuals with higher education levels tend to be more environmentally friendly (Cincera and Krajhanzi, 2013; Meyer, 2015). On average, 68.20% of the participants to this study graduated from university, which confirms this trend. But if evidence suggests a positive correlation between education and environmental behaviour, undertaking environment-related courses may be more influential in increasing environmental consciousness than non-nature-related courses. Ntanos, Kyriakopoulos, Arabatzis, Palios and Chalikias (2018) argue that there is a need for more solidified environmental education as early as primary and secondary school, and they agree, as I showed previously, that family and out-of-school societal opportunities are also key in environmental education.

The participants reported experiencing events that initiated environmentally conscious changes while attending environment-related courses. An American participant, and former student at the University of Michigan, says that “pursuing Environmental Engineering as a degree and attending the New England Literature Program were two big catalysts”. Similarly, an Australian participant recalls the importance of his time at university in shaping his ecological attitude: “Our lectures took us to a clear felled forest to learn where the timber we were using had been harvested from. This visit changed the course of my life”. Similarly, some report “studying environmental science” (AUS), or “learning about the impacts of climate change in my freshman bio-geography class and writing about it in freshman writing” (US). Educational institutions and academic programs are helpful in influencing pro-environmental behaviours only when the curriculum focuses on nature- and ecology-related studies (Henderson and Tilbury, 2004). Consequently, Cincera and Krajhanzi (2013) contend that it is important to further develop the institutions’ curricula to encourage environmental awareness.

5.3.4. Ecological emotions

The first thing that I saw during the preliminary analysis phase was the amount of guilt, anger, and pessimism expressed by the participants. I have created a diagram (below) based on the findings from SQ 17 on modern human creations as part of nature. The participants either expressed negative sentiments (sadness, guilt, anger...) or positive sentiments (acceptance, admiration...) in their relation to nature, and as the diagram shows, negative sentiments are predominant. I want to make clear that their answers were not clear-cut and sometimes positive and negative feelings would overlap. What I term ‘negative’ sentiments included answers reflecting a ruptured human-nature relation, while ‘positive’ sentiment included answers reflecting a harmonious relation. The feelings expressed in the participants’ answers to SQ 17 stemmed from their views of the humanature continuum or of the human/nature dualism. Moreover, to analyse the data of SQ 17 further, a chi-square test was performed to determine whether there was a correlation between the country of origin and sentiments, whether positive or negative, towards modern creations. I proposed the following hypotheses:

- The null hypothesis (H₀): There is no relationship between the country of origin and sentiments towards modern creations.
- The alternative hypothesis (H_a): There is a relationship between the country of origin and sentiments towards modern creations.

The results of the chi-square test fail to reject H_0 , $\chi^2(1, N = 137) = 1.28, p > .05$. This means that there is no significant relationship between the country of origin and sentiments towards modern creations.

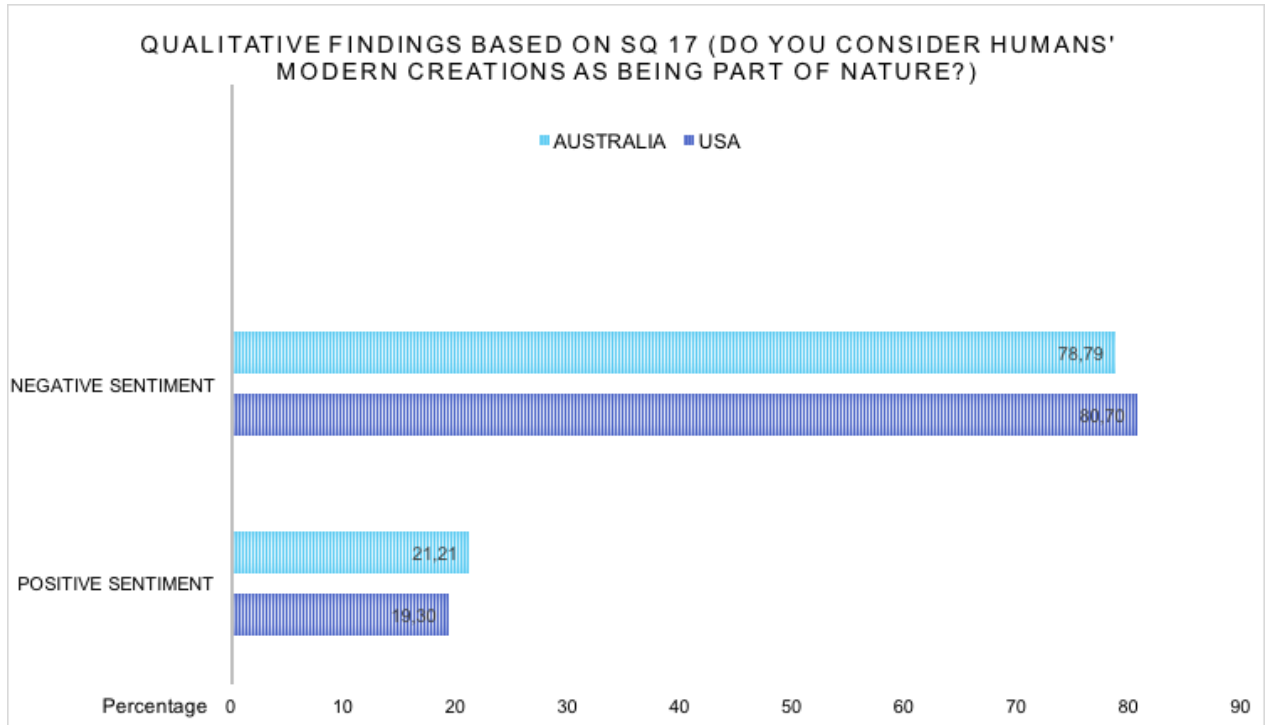


Figure 26.

Qualitative findings based on SQ 17 (Do you consider humans’ modern creations as being part of nature?)

Recurring emotions were guilt, anger, sadness and anxiety. Interestingly, several of these emotions have been reinterpreted in the context of the ecological crisis, and researchers talk about eco-guilt, eco-angst, eco-grief and solastalgia (Albrecht, 2019; Cunsolo and Ellis, 2018; Mallett, 2012). Participants tend to express their views in an emotional swirl where anger, sadness, anxiety and guilt are all intertwined. Yet, for the sake of clarity, I will describe each sentiment separately in the following subthemes: eco-guilt, eco-grief and solastalgia.

Eco-guilt

Eco-guilt, which Mallett (2012, p. 223) defines as the “guilt that arises when people think about times they have not met personal or societal standards for environmental behavior” is as much

present as collective guilt (or group guilt) in the participants' answers. Guilt is related to moral values, and implies the differentiation of intentions, decisions and actions between those that are proper and those that are improper (Long and Sedley, 1987). Collective guilt is the emotional reaction that results among a group of individuals when it is perceived that the group illegitimately harmed members of another group, in this case the natural environment. Branscombe and Doosje (2004) argue that it is often the result of sharing a social identity with others whose actions represent a threat to the positivity of that identity. Collective guilt and eco-guilt are ultimately linked because, as Mallett (2012) observes, eco-guilt mediates the relations between personal standards and public efforts to protect the environment. While all participants demonstrated pro-environmental behaviours, this did not prevent them from feeling guilty for their environmental footprints, as an Australian eco-villager who built his own house explains:

I associate nature with the natural habitat – the plants, non-domesticated animals, earth, water and air. I suspect I feel separate from these things because of my guilt for living what I deem an ‘unnatural’ life – reliant on technology that dominates and destroys nature.

I had some difficulties understanding whether participants were feeling guilty for their own behaviours or for being part of what they deemed a harmful society. As Branscombe and Doosje (2004) allege, for an individual to experience collective guilt, he must identify himself as a part of the in-group. This produces a perceptual shift from thinking of oneself in terms of ‘I’ and ‘me’ to ‘us’ or ‘we’. The participants' answers were a mix of pronouns, started with ‘I’ before turning to ‘we’, and also to ‘they’. The following example is one among many others: “I believe that humans have the ability both to destroy and to regenerate wilderness. We are the only creature that seems to destroy so readily” (AUS). Most participants tend to differentiate themselves from the group (using ‘they’, or ‘he’), which creates an impression of rejection of society and its values which I interpreted as collective guilt (“Man destroys”; “Humans are a virus that destroy most places they inhabit”; “MAN = ARTIFICIAL”). This rejection generates a tension and ultimately guilt because the individual knows that she/he is part of that community. The following answers illustrate the ‘I’ vs ‘they’ dichotomy:

I think most of what humans do is detrimental to nature. If humans were to disappear from the earth, the earth would thrive without them. Animals and nature are all interdependent but humans are not part of this system. (US)

I despair that human beings are the most destructive, selfish, greedy species on Earth....
When I'm feeling at my worst, I feel that we, humans, are a disease for the planet (a terrible thing to think but it's how I feel). (AUS)

The strength of the guilt expressed in their answers is sometimes balanced with an accepting view of the harmful nature of human lifestyle. Humans are a part of nature even though “they developed technology that destroys nature”, an Australian participant observes, adding that “human civilization is like a virus but viruses are a part of nature”. This comment reflects another comment by an Australian participant, who thinks that modern physical disconnection with nature is at the root of the problem: “We are nature. There is no distinction. But, a bit like cancer, we can behave very destructively outside the natural order of things. That doesn't make us not nature. It just makes us out of balance”.

Eco-grief and solastalgia

Ecological grief is a psychological response to loss caused by environmental destruction and/or climate change. Cunsolo and Ellis (2018, p. 280) suggest that “grief is a natural and legitimate response to ecological loss, and one that may become more common as climate impacts worsen”. Eco-grief is related to solastalgia insofar as both concept express despair and sadness for nature. Solastalgia brings an additional element of longing for nature (Albrecht, 2019). Some participants had never heard of the concept of solastalgia before taking the survey, yet they express a deep connection to nature.

I didn't know there's a name for it but I find it painful when I see bush destroyed to build big artificial mansions requiring air-conditioning and using a lot of electricity. There are so many similar things done in the world today that I can't write them all down. (AUS)

Research shows correlations between connectedness to nature, self and well-being (Olivos and Clayton, 2017). In the following experiences of solastalgia, ecological grief and sadness are related to one's sense of self, and participants describe nature as an extension of their own identity.

I have never thought about it like this before. This is new to me. It feels like a layer of myself is being peeled away. Or a layer of slime or dirt is covering me. (AUS)

The disconnection when I moved to the city made me feel like I had lost a part of myself. (AUS)

In the face of ecological destruction, participants report feeling “devastated”, “anxious”, “powerless”, or “sad”. According to Albrecht (2019), human health is directly linked to ecosystem health. Some American participants add:

I was in high school when I first had this feeling. I looked out the window and saw parking lots and ugly brick buildings. I wrote a poem about it. I just think it’s so sad the way humans alter something so beautiful (nature) and make it permanently bleak.

Whenever I go home and see my dad has cut down one of the plants that I planted years ago, I feel a loss. Surprise, anger, sadness. I want to tell stories about them, the lost plants. They are almost like people I want to remember.

American findings differ from Australian findings in that the Americans participants share more solastalgia experience related to a longing for nature and the need to go outside while Australians refer more often to the distress aspect of solastalgia where they feel sad when witnessing nature destruction and they have fewer occurrences of longing for nature. This may confirm other findings that show that, on average, American participants are more digitally connected and have less nature time than Australian participants, a subject that I will discuss in chapter 8 (point 8.4). Participants acknowledge the importance of listening to their gut feeling in a world where modern structures prevent from exposure to nature. An Australian participant suggests that modern urban life is inadequate for human beings. He talks about “a sudden urge to get out of the house/office after missing much of the day’s sunshine, sitting indoors” and argues that listening to the body reaction is important:

Evolution is constantly adapting our bodies to our environment and I think we either choose to fight the sensational urge to get up and get out to be comfortable with an entirely indoor life, or go with it and retain that link to an active body. The brain will switch off eventually and just go with it either way. It is simply a red flag that you are adapting away from the way you were. (AUS)

Similarly, when spending time indoors or in urban areas, participants report experiencing “a feeling similar to claustrophobia” (AUS), “a type of gagging reaction of the body” (US), or “a longing for freedom and nature” (AUS). Mitchell (1947) explains that urban life is psychologically upsetting and that humans lose their ‘psychic stability’ when divorced from their roots. A feeling that many participants confirmed.

After attending class, I found myself longing to go outside. Where I have always been the kind to crave cities and experiences, I found myself almost hurting to go outside and get away. (US)

I feel it when I've spent too much time indoors, working on computers. I feel like I just need to escape and get outdoors. (US)

5.3.5. Digital mindfulness

I have coined the term digital mindfulness to express a conscious, intentional and balanced use of digital technology and the Internet. Mindfulness, a significant element of Buddhist traditions, is the psychological process of purposely bringing one's attention to experiences in the present moment. To put it simply, mindfulness means awareness, it means to be more thoughtful. It has been developed in the Western context by researchers such as Jon Kabat-Zinn (2013) and Herbert Benson (2015) who pioneered the mindbody research. Being digitally mindful means choosing online activities that support things one values, and being able to miss out on everything else and switch off easily. Digital mindfulness is related to the notion of digital minimalism that Newport (2019, p. 28) defines as "a philosophy of technology use in which you focus your online time on a small number of carefully selected activities". Survey questions 25 and 27 and interview questions 7, 8, 9, and 10 were related to digital technology. I identified the following subthemes: digital minimalism, and the Internet as a tool for pro-environmental development.

Digital minimalism

Participants use the Internet and digital technology in an intentional, mindful manner. They balance screen time with other activities, keep control over their online time and know how to disconnect when needed. Overall, they report using the Internet in moderation, intentionally and mostly for valued activities. Survey question 25 (Do you periodically unplug and deliberately take a digital detox?) helped me understand what screen time was balanced with and also the extent to which they spent time in nature instead of online. The diagram below illustrates the three main categories of activities that the participants turn to to balance their digital consumption, namely social time (time spent with family, children, friends and/or relatives at the end of the day or during weekends and holidays), nature time (time spent in a natural environment, exercising, walking, gardening, hiking, camping, surfing...), and knowledge expansion (time spent reading paper

books, painting, cooking, crafting, playing an instrument, learning a foreign language...). I also performed a chi-square test which shows that there is no significant relationship between the country of origin and the different ways that offline time is spent, $\chi^2(2, N = 132) = 2.78, p > .05$.

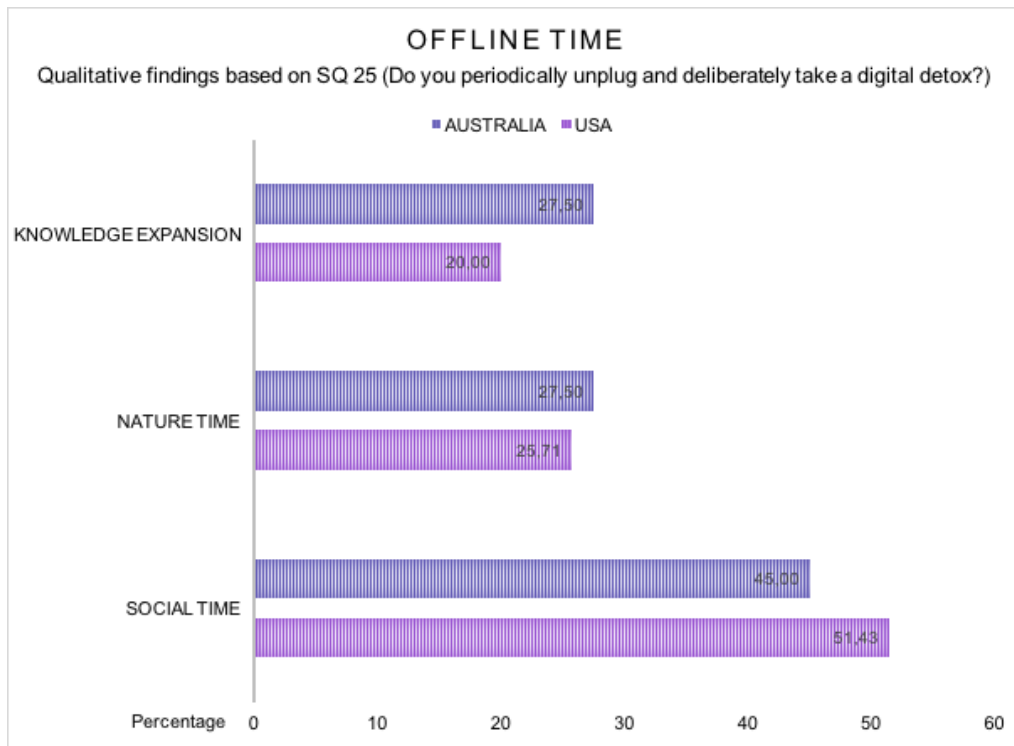


Figure 27.

Qualitative findings based on SQ 25 (Do you periodically unplug and deliberately take a digital detox?)

If a minority of respondents practice extensive digital detox, many simply moderate their digital consumption on a daily basis. “Although not qualifying as a digital detox, or complete break, I have consciously thought about what types of digital media I consume and made changes to my habits”, an American participant explains. Likewise:

I check my emails almost exactly once per day, but sometimes I skip a day. I check my texts two or three times a day, but I don’t own a cell phone; I only use google voice via my computer for text messages. I stop using technology after dark and instead turn to drawing/writing by hand (with pens and paper), and reading paper books. (US)

As an Australian participant puts it, they “determine” their connection. “Overall, it’s my choice whether I go outside – not my computer’s” (US); “I have control over the impact of digital technology in my life and can say no and walk away when I feel the need” (AUS); “It’s my choice - nobody is forcing me to spend all day at a computer” (AUS); “I pick and choose how I use technology, and how much I let it intrude” (US). Many report making no effort to unplug and doing it every so often “naturally”: “I don’t plan it but it happens every week naturally” (US) - “My ‘detox’ is not as planned as a routine – my brain tires of a computer quickly and I feel compelled to take breaks to exercise, read, play guitar, cook, or engage in something non-screen-related” (US). As an Australian participant shares, “It’s all about balance and how you use your time”. An American participant confirms: “I view technology as a tool, and use it when necessary”. Many balance screen time with green time: “I generally take Saturdays off and try to commune with nature” (US); “If I want to walk in nature, I switch off, stop other things and do it” (AUS); “I make sure to sit silently in a garden/forest for at least one hour a day” (AUS), “I can love both nature and Netflix!” (AUS). An Australian respondent explains that nature is a way to “recover” from online time. They also take advantage of their surroundings to enjoy offline time. It can be when socialising: “I do make an effort to stay off electronics while spending time with others” (US), or due to bad Internet connection: “I don’t deliberately do [digital detox], but our Internet is very intermittent, so it happens whether I want it to or not. I try to take it as an opportunity rather than a frustration when it happens so randomly” (US). Similarly, an Australian participant comments:

I find, when the Internet is down at home (not an uncommon experience), that I don’t have a problem with this, except for the simple fact that it is essential for my work. I have no need for the Internet otherwise, and do not really miss it when it is not available.

The Internet as a tool for pro-environmental development

One of the main surprises of the findings was how helpful and beneficial digital technology is considered in relation to nature connection. Participants use it as a tool for environmental education, to strengthen pro-environmental behaviours and to spread awareness on ecological issues. A majority of respondents answered (SQ 27) that the Internet has neither helped nor prevented their connection to nature. The qualitative analysis that I realised on the comments following this question revealed that it had actually *both* helped and prevented nature connection, and that the predominant tendency was positive. As this Australian participant sums it up, “Technology has brought me greater access to others’ thoughts and experiences of nature. It has

also provided me with more information on the natural world beyond my easy reach”. Similarly, an American interviewee, demonstrates the value of the Internet to deepen a connection to nature:

I would say that my recent more radical sense of deep connection has been made possible through the Internet – especially being able to find and read and hear people like Tim Morton, Val Plumwood, Zoe Todd, Kim TallBear, Eileen Crist, and others. These connections, I feel, have given me more access to connection with the landscapes and other species around me. I also tend to break up my screen time while working in the studio with more active physical activities.

Participants use online time purposefully, and digital activity is not socially isolating, it inspires physical outdoor activities that extend their relationship with nature and with like-minded persons.

I do lots of gardening so the Internet is very handy tool when I need to know something about a plant, insect or bird or composting or growing vegetables, etc. It’s helpful when I need it. Nature still calls as the weeds keep growing, I keep pulling, and the grasshoppers keep eating my plants! Help, Doctor Google what do I do? (AUS)

Likewise, an American participant observes that “Social media helps me connect with other folks who are out in nature, sharing their experiences. This is an inspiration to me, a motivation to get out there”. They can learn about nature (“I can google a plant or insect, and immediately learn about its lifecycle, origins, food preferences, relationships. It’s an incredible learning tool!” AUS), and reach out to meet others (“It has helped connect to local events and groups in my neighbourhood such as Bird watching clubs and landcare groups” - US). Participants see digital technology as enhancing nature experience (“I have always had a comfortable relationship with nature. I feel good when I am out of the city and in natural environments. Technology sometimes makes that more possible.” - AUS).

During the interviews, I asked participants whether they felt relaxed, tense or stressed after screen time. Many studies (Cash, Rae, Steel and Winkler, 2012; Gittleman, 2011; Penglee, Christiana and Rosenberg, 2019) have described the negative mental and physical effects of digital technology. Most persons answered that it depended on their online activities. “It’s not the medium, it’s the information”, an American participant claims. The Internet is a tool, it mirrors its user. An Australian interviewee illustrates this very well:

I believe screens can be nourishing, like if I am creating something that I love (I am a designer also) that will energize me. Or they can be completely depleting, like if I am doing accounting. I don't think screens are inherently bad, but they are over-used tools and have taken over especially as a tool for entertainment. I believe that screens are more often depleting than energizing but just that it is not a rule. I try to use screens for things that require screens, and balance that with physical, real world activity in nature/outside and with other forms of entertainment such as reading and social activities like games and conversation.

5.3.6. Digital solastalgia

Digital solastalgia is one of the key findings of this study. As I explained in chapter 3, digital solastalgia is an expression that I coined based on Albrecht's concept of solastalgia (Albrecht, 2005, 2010, 2012, 2019). Solastalgia is defined as the distress experienced when surrounding nature is negatively impacted by urban transformation. And I define digital solastalgia as the distress felt when hearing about global ecological issues online. It is important to mention that Albrecht (2016, 2019) refers as well to what he calls *virtual solastalgia* which can be generated by movies such as Avatar. As Albrecht (2016) explains, in Avatar, people can see an alternative world, which is "beautiful, diverse and complex, one that meets their aesthetic, spiritual and ethical needs, they want to live within it. During the three-dimensional movie, they experience a virtual solastalgia as they become virtual participants in the attempted destruction and desolation of the Na'vi and other life forms in this pristine environment". In comparison, digital solastalgia as I define it is anchored in real life and refers to real, not fantasized, ecological damage which are experienced online instead of in real life. Digital solastalgia is the lived online experience of negative environmental change. It is experienced through digital devices and it is linked to the advent of digital technology and online experiences of the Internet, social media applications such as Twitter, Facebook, etc. and platform such as YouTube, etc. Digital solastalgia seems to be a growing problem for our connected society. Participants use the Internet to browse nature-related subjects, yet they cannot help but learn about global ecological issues. Digital nature (i.e. the experience of nature online), just like real nature, reflects the current ecological crisis. Participants can intentionally use the Internet to search positive experiences of nature (such as documentaries, inspiring pictures, articles promoting human nature, etc.), yet the majority reported experiencing digital solastalgia when checking the news, social media, etc. They assert that digital solastalgia is more omnipresent in

their lives than solastalgia, and it is all the more overwhelming that one cannot do anything about it.

I experience digital solastalgia almost on a daily basis when reading the news [with] global examples such as climate change. In comparison, I feel solastalgia far less often.... Being able to actively make change in my own community is important to me as it helps me to feel less distress about the environmental impacts I see. I feel that digital solastalgia is more distressing as I am more distant from the source and feel powerless to take action. (AUS)

I probably feel, in total, more stress from digital solastalgia than physical solastalgia because I more often, and at a more terrible scale, encounter global ecological disaster online than in my own community. (US)

Many consciously try to avoid some specific platforms or social media that could ignite a feeling of solastalgia. “I have to limit my time on Twitter because of it”, an American participant observes. Likewise, an Australian interviewee thinks that the omnipresence of digital technology makes it difficult to avoid hearing about environmental issues, “It can be beamed into your world every day, multiple times a day along with the human distress it causes”.

As the concept of digital solastalgia conveys, the Internet can be disconnecting from nature. Indeed, many respondents report feeling impacted by the negative effects of digital technology. This tendency is more important in the American findings than in the Australian findings. I detailed in the previous chapter how American participants are more connected than Australian participants, which may account for such a negative sentiment (17.95% of Americans, for only 6.67% of Australians, depicted their digital habits as hindering their connection to nature). Yet, the negative impact is also apparent in the Australian findings. As an Australian participant argues, sometimes nature and digital technology are simply incompatible: “It is not easy to read from a screen outdoors, so I tend to stay indoors and have less nature contact”. Asked if he sometimes practiced digital detox, another Australian participant simply answered “No, I’m an addict”. Digital technology is criticised for being addictive, and for being an indoor activity. “[Digital technology] is addictive and takes up time and energy. It’s likely that I would spend more time outside if I wasn’t so curious and sucked in to the computer”, an American participant comments. Some express feeling overwhelmed by constant connectivity, what researchers call information overload (Rachfall, Williamson and Temple, 2014). “I’ve spent much more time inside and on the

Internet than I think I would have if it wasn't available to me" (US). According to this American participant, screen time is opposed to outdoor time:

Use of digital technology is very attractive in that it takes little effort and it gives constant rewards for usage. It is so attractive that I spend a lot of time using it rather than doing things I used to do such as take nature walks.

Screen time also means time spent immobile while the mind is busy online. This reflexion led me to ask questions during the interviews on a potential mind/body disconnection generated by online time. I prompted interviewees to compare their digital experience of nature to their real experience of nature. They argued that the Internet, however helpful, does not compare to direct nature experience.

There is nothing like actually being outside with other living beings, not just pictures of them. Digital-based natural experience can be inspirational at times, but actually connecting with nature physically (usually outdoors) is the most rewarding. Yes, I think the digital experience eventually leads to disconnection from nature and the body. (US)

I actually haven't watched a whole lot of environment-based things online. Most of what is experienced through the computer is fake, so it makes sense that there would be some sort of cognitive dissonance happening as the brain is trying to reconcile competing feelings. (US)

However disconnecting and addictive digital technology may be, participants tend to be conscious of its impact and to act upon it, which can be related to the theme on digital mindfulness.

I'm working on it. Because of my occupation (teaching computing), being significantly out of the loop is not a practicality. But I have rejuvenated some old hobbies like astronomy, nature walks, painting, which are gradually making inroads into my use of computer technologies. (AUS)

Often, if I've had to be in front of a screen for an excessive amount of time I have a great desire to just go out and lie on the grass and look up at the branches of the nearest tree. Then I feel better. Experiencing nature through the screen does not make me feel physically good, but it does have a positive mental effect for the time you are watching it. (AUS)

5.4. Conclusion

A thematic analysis of the qualitative findings shows that nature beliefs are increasingly shaped by global influences. The commonality of the themes shared by both American and Australian participants reveal prevalent views of nature as estranged from humans, even though all participants demonstrate pro-environmental behaviours and environmental awareness. The theme on connectedness to nature, even though it represents a minor trend, also means that mentalities are slowly evolving. Digital technology is described as a helpful tool in developing pro-environmental behaviours. It is interesting to note that the negative effects of digital technology (i.e. addictive, indoor activity, etc.) are largely referenced by participants, but that, in general, they manage to handle them and maintain an intentional digital usage. Additionally, and this is a point that I will develop in the discussion, the more nature connectedness the participants report, the more balanced their digital activity (this trend is one of main differences between the American group and the Australian group).

In the following discussion chapters, I will contextualise the quantitative and qualitative findings along with the literature review. I have divided the discussion part into three chapters. The first part of the discussion, chapter 6, is on nature, the second part, chapter 7, is on culture, and the third part, chapter 8, is on digital technology. I wanted to know, when I started the research, why we separate from nature. Western culture is seen as the root of the human/nature split. Many participants decried Western cultural heritage, capitalism, the prevalence of Judeo-Christian beliefs or also the patriarchal system for being responsible for our estrangement from nature. As I argued in the literature review (chapter 2), the human-nature relationship has evolved away from the human/nature dualism to the point that researchers talk about environmental identity, and claim that identifying with nature is an important step to prevent environmental damage (Clayton, 2003). Such ideas will be developed in the first part of the discussion on nature (chapter 6). Then, I will extend the discussion on nature to culture in chapter 7, explaining that in a humanature perspective, nature and culture are intertwined and cannot be understood separately. And in the final part of the discussion (chapter 8), I will discuss these arguments in the context of the digital age and ponder over the influence of digital technology in the process of redefining human identity according to nature.

6. Discussion Part One: Nature

6.1. Introduction

This discussion will link together the findings and employ a reflective approach to analyse the three major concepts surrounding this thesis: namely nature, culture and digital technology. As discussed in the introduction, the ideology of a static notion of nature, as is commonly used within environmental debates today, warrants questioning. It has become harder than ever to determine what constitutes *nature* since human involvement in the environment has acquired global significance (via access to transportations, tourism, the Internet, etc.). The produced phenomena that we perceive as nature seems to no longer exist in their own right independently of human beings. In modern times, the notion of nature is intertwined with that of wilderness, sustainability, ecological crisis, climate change, biodiversity, conservation and pollution. It is also an emotive subject as research on the relations between environmental damage and mental health show (Albrecht, 2005, 2019; Albrecht, Sartore, Connor and Higginbotham, 2007; Cunsolo and Ellis, 2018). Understanding nature also means understanding the culture of a community at a specific time and place. I have exposed in chapter 5 how it is almost impossible to talk about nature without talking about oneself, the perception of a thing being merged with the one who perceives it. Ducarme and Couvet (2020) explain that since scientific knowledge of nature is and will always remain incomplete, human beings have to rely on mental representations and theoretical constructs to define nature. In environmental philosophy, nature is understood via three distinct dimensions: cognitive, normative and expressive (Keulartz, Van der Windt and Swart, 2004). The cognitive dimension refers to people's understandings of nature, to how they define and describe nature, to what phenomena in the real world they consider to constitute nature. The normative dimension concerns people's ethical views on the values of nature and it is connected to ideas on how humans should treat nature. The expressive dimension pertains to how nature is experienced aesthetically and emotionally. These dimensions are validated by the present study's findings, and I will provide a definition of nature following these categories.

6.2. The cognitive dimension of nature: The physical expressions of the environment

6.2.1. Nature categorisation and contemporary definitions

Categorisation is the process through which ideas and objects are recognised, differentiated, classified and understood, and it is vital to cognition. According to McGarty, Mavor and Skorich

(2015), categorisation and classification allow humans to make sense of things and to simplify their understanding of the world. The main present Western meaning of ‘nature’ as designating what is opposed to humans is currently being redefined and nature now encompasses many physical expressions in relation to humans. In environmental philosophy, this is related to the cognitive dimension of the image of nature (Keulartz et al., 2004) and the material expressions of nature. In the context of the present study, an important point of the survey was to understand how participants perceived nature and what they considered nature to be. For instance, they were asked to provide their own definition of nature, and based on cultural differences between Australia and the United States, they were also asked to differentiate between nature, wilderness and the bush. From wilderness to wildland, bush or urban nature, understanding nature through categories and scales has been a common trend in the participants’ answers. The following comment by an Australian participant is an example of this:

I personally have a scale where I acknowledge things have varying degrees of human influence. For instance, a garden is made up of ‘natural plants’ but the distribution of those plants is designed by humans, so a garden is ‘somewhat natural’. The Wilderness is not designed by humans and is an assortment of naturally distributed plants, so it is ‘mostly natural’, while the bush is a word I use to describe a certain type of ecosystem. In Australia, the bush is used to describe a semi-arid forest.

Categorising is also a common tool for researchers and environmental organisations (Aplet, Thomson and Wilbert, 2000; IUCN, 2008). For instance, the IUCN, through the IUCN protected area categories, first established in 1994, has taken into account the diversity of natures in the process of nature conservation (IUCN, 2008). The seven IUCN categories refer to particular representations of nature, and some include human influence. The first category, “Strict Nature Reserve”, spares its areas from human disturbance. The second category, “National Park”, aims at protecting functioning ecosystems. It offers a more dynamic view of the environment. The third category, “Natural Monument”, refers to places of spectacular visual interest for humankind and it is related to the expressive dimension of nature in which nature is praised for its aesthetic values (see point 6.4). It considers natural features in the same way as human achievements. Such vision of conservation is by nature static, and aims at transmitting such features to the next generations in the same state. It is interesting to note that many places protected under this category shelter hardly any biodiversity (volcanoes, caves, high mountains, etc.), diverging with a vitalist vision which

sees nature as an evolving entity. Vitalism, as a philosophy, is the belief that living organisms, because they contain the vital principle of energy, are not to be reduced to mere mechanical laws of physics (Bechtel and Williamson, 1998; Keller, 2002). The fourth category, “Habitat/Species Management Area”, focuses on particular “charismatic” species (Ducarme, Luque and Courchamp, 2013) as embodiments of nature, and may imply an active intervention on such species (predator and pest control, translocation, demographic management, etc.). The fifth, “Protected Landscape/Seascape”, and sixth, “Protected area with sustainable use of natural resources”, categories integrate both quite a static vision but also human use under some conditions. Humans are considered a part of nature and their activities as objects worthy of protection.

Increasingly, researchers also question the boundaries between nature and cities, and they show the importance of a representation that would integrate both (Aplet, Thomson and Wilbert, 2000; Kendal, Egerer, Byrne and Jones, 2020; Stocker, Suntken and Wissel, 2014). In the urban age, a new relationship between city and nature is a key challenge for nature conservation and for the future of wilderness, as experiencing urban wild areas can help increase the readiness to protect wilderness outside cities (Trzyna, 2005). A majority of participants to the present study grew up in urban or semi-urban areas and got to know nature from an urban perspective via urban green spaces designed by humans. Stocker, Suntken and Wissel (2014) argue that urban nature (including city forests, riverbanks and other remnants of pre-urban natural landscapes) can have wilderness-like properties. If wilderness areas are of capital importance for biodiversity protection, they explain that, considering the continuing biodiversity loss in cultural landscapes around many cities, urban wildness is also significant for biodiversity protection and for environmental education. A systematic categorisation of urban nature has been proposed by Kowarik and Korner (2005), which include four kinds of nature: remnants of the original natural landscape, relics of the cultivated landscape, landscaped green areas, and urban-industrial nature. This aims to establish wild nature as an integral part of the urban natural infrastructure and to secure the acceptance of urban wildness by the population. Such studies are important because, as participants to the study showed, an urban experience of nature in childhood is often built on human/nature and city/wilderness oppositions. Nature is viewed as opposed to the city, yet this view was, in the case of the participants, moderated by the pro-environmental education that they received throughout the socialisation process. Moreover, such studies show an evolution in what we define as nature and a need to integrate human beings and their creations as part of nature.

Still, nature, and its various representations, are both perceived as close to *and* remote from humans. Aplet, Thomson and Wilbert (2000) posit that the naturalness of an environment is directly related to its freedom from human intervention. In their conception, wildness increases in two directions: from the controlled to the self-willed along a gradient of freedom, and from the artificial to the pristine along a gradient of naturalness.

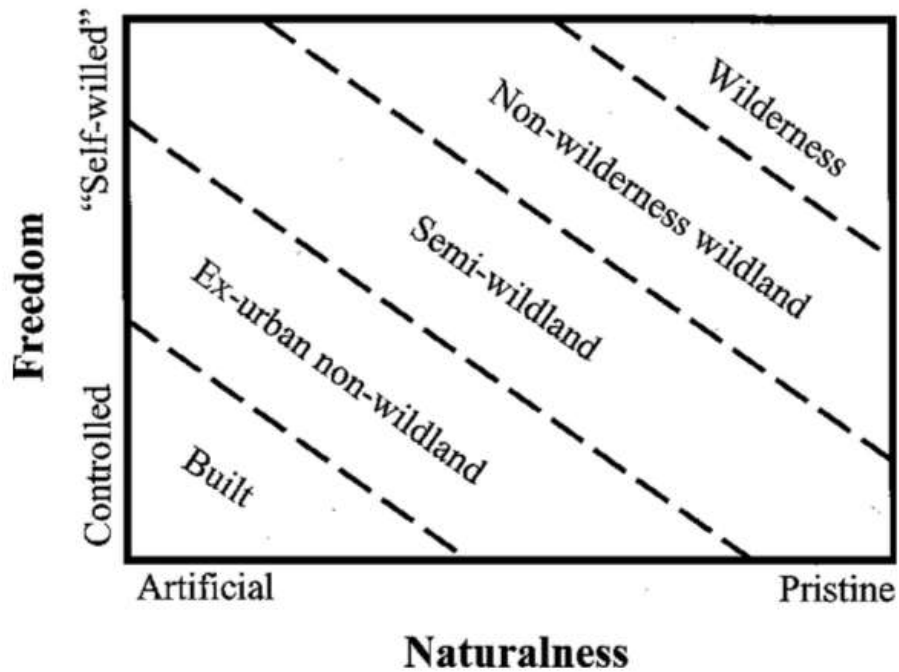


Figure 28.

The “continuum of wildness” (Aplet, Thomson and Wilbert, 2000)

Wilderness is that portion of the landscape that is most natural and free. Aplet et al. (2000, p. 90) further argue that the freedom of the environment is to be paralleled with the freedom experienced by the individual – a wild environment is both “a place *that* is free and a place *in which* to be free”. Wilderness is both a real place *and* an experience. This confirms the current study’s results which show that the perception of nature is merged with the one who perceives it. As a result, the indicators for wildness are based on both external characteristics of the environment and internal

perceptions of it. They include, for instance, the degree to which it provides opportunities for solitude, the remoteness of the land from mechanical devices, the degree to which it maintains natural composition, and it remains unaltered by pollution.

6.2.2. *Nature, wilderness and the bush*

How does living and growing up in a specific environment model our relationship with the natural environment? The present study deliberately addressed three representations of the natural environment which are overtly criticised by modern academics: nature, wilderness and the bush. The findings show that nature, as confirmed by the literature in the point above (6.2.1), requires categories to be understood by the Western mind, that some of these categories differ from Australian to American culture, and that many of them are similar and part of a globalised environmental culture.

American and Australian participants grew up not only with nature but with wilderness and the bush. This unique geographical context set them apart from European landscapes. Participants use categories to describe the environment. Their answers reveal that nature, wilderness and the bush are cultural representations and are defined on the basis of being more or less impacted by humans. The following quote from an American participant sums up this categorising of nature: “nature = the presence of living things. Wilderness = the absence of man’s long-term impact, and is filled with living things. Bush = the wilderness, completely untouched! (little to no visitors)”. The US findings show that nature is an all-encompassing term. While 62.86% of American participants define nature as human-exclusive, when asked to relate the notion of nature to other environmental configurations (i.e. wilderness and the bush), they tend to connect human and nature more easily and define nature as being “everything”, “everywhere” and “gentler to my human condition” or “just outside my door”. In other words, if nature does not fully include human beings, it is accessible to them. What may look like paradoxical or illogical answers actually shows how much nature and culture are connected. Indeed, the same participants who see wilderness as nature without human admit that the terms *nature* or *the bush* (for Australian participants) may include humans. Many studies (Chawla, 1992, 1998; Chawla and Derr, 2012; Hart, 1997; Prevot, Cheval, Raymond and Cosquer, 2018) argue that building place attachments via one’s natural surroundings contributes to the establishment of identity, sense of belonging and environmental values of

individuals. The participants' answers acknowledge the weight of the wilderness definition as it is proposed in Western culture. These different views of nature (nature, wilderness, the bush) can then all be seen as culturally inherited.

One of the main differences between the Australian and American findings is the concept of the bush, which, in Australia, is seen as the junction between humans, nature and wilderness. "Bush is a sub-set of wilderness, which is a sub-set of nature", an Australian participant explains. The concept of the bush, which is iconic in Australia, refers to a natural undeveloped area (Pinnington and Lafferty, 2004). The fauna and flora contained within this area is predominantly indigenous to the region, although exotic species can often also be present. The term 'Outback' is also used, but usually in association with the more arid inland areas of Australia. It refers to wildland but it is different from wilderness. The cultural dimension is important, and the bush is perceived as uniquely Australian ("I consider the bush to be in line with various Australian and Indigenous Australian images", "an Australian term for nature", "the bush is a social concept unique to the Australian mindset"). A majority of participants from both countries define and categorise nature in relation to its remoteness to civilisation. This is in accordance with the American Wilderness Act and the notion of wilderness as a place devoid of human, which both groups of participants grew up learning about and which was part of their Western ideological heritage. The closer to humans nature is, the less 'natural' it is seems to be a common bias. Yet, the bush is described as an accessible part of wilderness. As an Australian participant argues, "Nature is all around, the bush has some proximity to urban settlements and wilderness is those places further away from human settlements". In the Australian findings, the concept of the bush works as an intermediary between human and wilderness and it helps to connect people to a form of wilder nature ("wilderness is the wild and the bush is for activity, walking, exploring, etc." - AUS). As for the Americans, the notion of bush is often unacknowledged or mistakenly acknowledged. Thirty-seven percent of American participants do not know what the bush means ("not sure about the bush", "a bush is a large plant"), while about the same amount (34%) acknowledge that it is a foreign concept, either related to Australia or to Africa ("Bush is like wilderness, but in Australia", "Bush is a term I've heard only to describe the savannah on the African continent"). Words and language are tools that reflect cultural perceptions of nature in an attempt to describe an external reality. Like an American participants puts it, "These are different

words for the same thing, they are partially dependent of nationality”. Because there is no bush in America, there is no word for it.

With the bush being left out of American representations of nature as there is no reality for it in the US, the American findings are more final about the difference between nature and wilderness. Urban nature and more precisely urban wildness, as defined by Kowarik and Korner (2005) and Stocker, Suntken and Wissel (2014), is how American participants first connected to nature and accessed environmental education in their childhood (“I played in the woods, swam in the ocean and had a backyard garden”; “I spent time in parks and creeks in the suburb where I grew up”, “My siblings and I roamed free in the neighborhood near home, we spent time in the meadows, woods, along rivers and ponds”). Survey question 14, which asked if their upbringing helped them nurture a relationship with nature, shows that only 5% of Americans mention national parks or areas of wilderness as early experiences of nature. Ninety-five percent first experienced nature in the form of urban wildness, in their backyards, or in semi-rural contexts. This may explain why a majority of 62.2% agreed with a wilderness definition that is human-exclusive. Wilderness remained the romanticised myth denounced by Cronon (1995) with no reality to match or debunk it. The few who questioned this definition argued in favour of an urban wildness and a form of nature that would be both accessible and would help generate pro-environmental behaviours. As an American participant states, “The wilderness definition needs to include its relationship to people, their dependence on nature and the ability for people and nature to be harmonious”. In comparison, the concept of the bush is an interesting expression of nature because, contrary to the notion of wilderness, it is a bridge between nature and humans, and nature and culture. It is a part of nature that accepts human beings. Australian participants were used to seeing wildland as accessible and part of humans’ everyday lives from an early age in comparison to American participants.

American and Australian participants alike acknowledge a facet of nature (which includes the bush for Australian participants) that is close to home, and which is somewhat opposed to the facet of nature as wilderness. According to the Monitor of Engagement with Natural Environment (MENE) survey (Natural England, 2019), attitudes towards and engagement with the natural environment have changed over the last ten years. Visits to natural spaces have more than doubled, and most people’s experience of nature is close to home, in green spaces in towns and cities. The numbers of visits to urban green spaces almost doubled in the last ten years with two in three visits

taken within five kilometres of home. As Suntken and Wissel (2014) point out, urban nature is now being redefined as urban wildness, thus creating a bridge between the human-exclusive notion of wilderness and the human-related notion of nature. While words may differ from Australia to the US (the bush, nature, etc.), participants from both countries confirm that their experience of nature is close to home.

The different physical expressions of nature, whether defined by the IUCN or as represented by academics, illustrate the tension between two main representations of nature: nature as a domain and nature as a process. When nature is seen as a domain, this is described as a static perspective. It aims at maintaining the environment in the same, unchanged state. Within this static perspective, nature is defined as an assemblage of components, the human/nature polarisation is omnipresent and sustainability consists of maintaining boundaries. When nature is viewed as a process, it is regarded as operating in a holistic fashion, as overlapping wholes that have properties different from the sum of their parts. The fundamental processes through which the ecosystem operates, rather than individual species or individual branches of scientific study, are the focus of management, and humanity is an element within nature. Representations of nature as a domain and nature as a process overlap in the present study, meaning both are conjointly existing. They also overlap in the cognitive, normative and expressive dimensions of the image of nature.

6.3. The normative dimension of nature: Nature and ethics

The normative dimension of nature as defined by Keulartz et al. (2004) concerns people's ethical views on the values of nature and it is connected to ideas on how humans should treat nature. This is linked to the field of environmental ethics. Environmental ethics is a discipline in philosophy that studies the moral relationship of human beings to the environment. The field grew up in response to such works as Carson's *Silent spring* (1962) and Ehrlich's *The population bomb* (1968). Although nature was the focus of much 19th and 20th century philosophy, contemporary environmental ethics only emerged as an academic discipline in the 1970s as a result of the human population explosion and the environmental crisis. In the United States and in Australia, inspiration came from the earlier 20th century American environmental literature, including authors such as Muir and Leopold. Their concerns were motivated by a combination of ethical and aesthetic responses to nature as well as a rejection of economic approaches to the value of natural objects.

In Australia, the land ethic sketched by Leopold, attempting to extend moral concern to cover the natural environment was drawn on by philosopher Richard Routley. According to Routley (1973), the anthropocentrism imbedded in what he called the ‘Western superethic’ is ‘human chauvinism’, another form of class chauvinism, which forbade the recognition that natural things have intrinsic value. The confluence of ethical, political and legal debates about the environment, the emergence of philosophies to underpin animal rights activism and the puzzles over whether an environmental ethic would be something new rather than an extension of existing ethical theories contextualised the development of the field of environmental ethics.

The modern understanding of the relationship between humans and nature encompasses a wide range of rationales for its preservation and exploitation, and these are omnipresent in the current study. First, it is important to differentiate ethics from morality. Contrary to morality, which is a personal compass of right and wrong, ethics are social rules of conduct respective to a specific group or culture within a particular time and place (Grannan, 2016). Ethics depend on contexts, which means that environmental ethics today is embedded in Western culture. Massanari (1998, p. 37) argues that environmental ethics, because it is part of Western culture, is founded on a human/nature dualism and that it still “assumes the moral priority of the human individual”. Contemporary environmental ethics is derived from minority trends within Western tradition (e.g. the contemplative enjoyment of the Romantics, the unifying links perceived by Darwinian theory, or the stewardship tradition within Christianity), and, according to Jenkins (1998), such trends have led to attempts to perfect or humanise nature (in the form of gardens, etc.).

The advent of environmental ethics shows the expansion of human moral objects from the people and society field to life and nature. As such, it laid the foundation for the concepts of environmental identity and the inclusion of nature into human self (Zheng and Sun, 2015). Environmental philosophers (Barbour, 1980; Passmore, 1974; Rodman, 1983) have distinguished between a number of different attitudes towards nature which each reflect a specific idea of nature’s value and of the human-nature relationship. These attitudes include seeing humanity as the owner of nature, the steward of nature, the partner to nature or the participant in nature. All these categories are present in the participants’ answers, sometimes juxtaposed in a same answer. In ecolinguistics, these metaphors are based on the opposition between the anthropocentric worldview and the biocentric worldview (Verhagen, 2008). They reflect how nature is understood as human-inclusive or human-exclusive. Nature as human-exclusive includes cultural representations such as

nature as God's creation and nature as a resource, and it depicts humanity as a dominator, owner or steward of nature. Nature as human-inclusive includes cultural representations such as nature as a subject (Mother Earth, Gaia) and nature as an ecosystem, and in this context, humanity is seen as a member, partner or participant. Whether starting from the nature angle or the human angle, whether talking of nature as a resource or humanity as a dominator, the remaining point is the relationship between them. These categories are ultimately inscribing themselves on a spectrum of relationships going from disconnection to kinship, from a separation between humans and nature to a unification of both. These common representations of nature could be found in the participants' answers and they included: nature as God's creation, nature as a resource, nature as a subject and nature as an ecosystem. The following section sets out these different representations of nature drawing on the data from the study.

6.3.1. Nature as God's creation

Nature is "anything God created" explains an American participant. Nature as God's creation is a recurring concept in the American findings of the present study, and part of the results that differ from the Australian findings (i.e. responses associating nature to religion are nonexistent in the Australian results). I invited ecovillages in Australia and in the US to take the survey, but, contrary to Australia, American ecovillages were sometimes religious communities, and more precisely Christian communities. There were no examples of religious ecovillages in Australia as they were mainly accepting all religions. Religious communities in the US shared strong environmentally-concerned practices to adapt to the limits of the planet and, as detailed below, offered views of nature which sometimes differed from traditional Christian views.

"Nature is our divinely created environment", "Nature is Heaven and Earth, and everything in between" are some American examples. Nature as a divine creation is related to the concept of *scala naturae* (generally translated as the Chain of Being) and goes back to classical Greek culture (Verhagen, 2008). Nature is depicted as a static entity and is part of a hierarchical order. In this hierarchy, the place of humans is based upon degrees of 'perfection' which, according to Aristotle, are determined by the 'powers of the soul' (Bowler, 1992). This metaphor makes humans the standard against which all other species are to be measured and is at the centre of the anthropocentric worldview. Nature and religion have long been associated, and many researchers

(Stoll, 1997; Toynbee, 1972) argue that monotheism (and more specifically protestantism) played a role in justifying the human exploitation of nature in America. Likewise, historian Lynn White (1967) makes the argument that Western Christianity has desacralised and instrumentalised nature to human ends, resulting in a ‘disenchantment of nature’. His theory is referred to as the ‘burden of guilt’ understanding of religion and ecology. The notion of guilt in the human-nature relation is more important in the American responses of this study than in the Australian responses and can be viewed as supportive of White’s ‘burden of guilt’ theory. While 57% of American participants define nature through the prism of human destructive influence on it, only 31.5% of Australians do. Americans describe human actions upon nature as “interference,” “disruption,” “intervention,” “machinations,” and nature as a humanless place (“spaces without the development and presence of humans”, “any landscape that is not man-made”, “greenspace that is free of buildings and other man-made infrastructures”). Nature as God’s creation is often depicted as part of an anthropocentric, rather than biocentric, view of the environment. It is also depicted as male as opposed to Mother Earth or Gaia. It reinforces the human/nature split. Yet, as the following testimony from an American participant shows, religion can also result in a respectful human-nature relationship:

I grew up in the Christian faith which teaches good stewardship, including with the Earth, although it does not always happen. I also think that my faith helps me to see that God created the world and I want to enjoy His creation by taking care of it.

As Kay (1989, p. 214) explains, “the Bible’s most persistent environmental message is that God confers human dominion over nature to righteous or faithful people, whereas God punishes transgressors with natural disasters”. The biblical notions of natural justice and righteous individuals in harmony with nature find current expression in the modern environmentalist movement. Derived from several writings (Cohen, 1985; Gerstenfeld, 2002; Kay, 1988, 1989), I was able to express differences in the human-nature relation as presented in Christian beliefs via the Hebrew Bible (see table 6 below). Although Judaism and Christianity are different, they are both Abrahamic religions whose common basis is the Hebrew Bible. The contents of the Hebrew Bible are similar to those of the Protestant Christian Old Testament. In this respect, the views of nature in the Hebrew Bible are representative of Christian views of nature.

Table 6.

Views of nature in the Hebrew Bible (Cohen, 1985; Gerstenfeld, 2002; Kay, 1988, 1989)

Views of nature in the Hebrew Bible	
Human/nature dualism	Humanature
God is separate from and transcends nature.	God made creation and called it ‘good’ (before humans were created).
Religious worship should be directed to God as the Creator.	Creation manifests God’s glory and is alive and responsive to God.
Humans are a special creation: they are the only part of creation that are created in God’s image.	Humans are a creature of God along with all other species.
Humans are given ‘dominion’ over nature.	God cares for all of creation, which is God’s, not the possession of humans.
	Humans are given the duty of stewardship, protecting God’s creation.

The Hebrew Bible’s principal environmental theme is of nature’s assistance in divine retribution. But, as Kay (1988) points out “the Bible’s frequent deployment of contradiction as a literary device, however, tempers this perspective to present amoral, yet multi-sided views of nature”. The American participants who viewed nature as God’s creation endorsed the humanature view, as detailed in the table above, rather than the dualistic human/nature view.

6.3.2. Nature as a resource

An anthropocentric worldview places human beings at the centre of the Earth, and is often associated with a utilitarian attitude towards nature. Nature and its diverse resources (e.g., water, forests, minerals) are seen as means to an end, that is, materials fuelling consumption, progress and continuous economic growth (Oelschlaeger, 1991; Merchant 2003). An essential component of the anthropocentric worldview, therefore, is the dominator model of the human-nature relationship where, according to Francis Bacon, the human being is not only the lord of creation, but also its principle of order (Marshall, 1994). Verhagen (2008) argues that the metaphor of nature as resource started with the Enlightenment, which ushered in the scientific and industrial revolutions, and the emergence of capitalism. Other scholars such as Moore (2016, 2017,

2018), via his concept of Capitalocene (explained in chapter 2, point 2.3.2), dates it back to the 15th century, when nature and the land started being commodified on a significant scale. The view of nature as machine continued into the 18th century, when the notion of its divine origins was gradually replaced by scientific explanations. As an example, Descartes believed that animals were nothing more than machines, incapable of pain and pleasure, who existed to perform some function in what he calls ‘the great apparatus’ (i.e. the universe) (Marshall, 1994. pp. 187-8). In the present study, a majority of participants describe nature as a resource which has reached its limited and finite capacities. The environmental crisis context is omnipresent in their responses. Only a few participants associate the environment with a concept of abundance instead of limitation, and with the human counterpart of the dominator. Some examples include: “Nature is the raw materials that naturally occur on the planet earth, which humans adapt and use for their needs”, or “Nature is the supplier of all”. A majority of respondents in both countries frame human relations to nature in a negative way (i.e. nature is being destroyed, negatively impacted by humans) with nature’s resources being scarce. On a psychological and philosophical level, the environmental crisis means a time in modern Western history where humans deal with scarcity, loss and deficiency. It questions the way progress and abundance have always been associated. This association has already been discussed, notably with such theories as the resource curse (also known as the paradox of plenty). The resource curse thesis states that countries with an abundance of natural resources (such as fossil fuels, minerals...) have less economic growth, less democracy, or worse development outcomes than countries with fewer natural resources (Ross, 2015; Smith and Waldner, 2021). The term resource curse was first used by Auty (1993) and further developed by Sachs and Warner (1995). The awareness of limited environmental resources today accounts for environmentalist movements such as the Zero Waste movement. The Zero Waste movement is the result of a shift in mindset, or worldview, and it both acknowledges humans as part of the environmental loop as well as the importance to reorganise waste management in a sustainable way. The Environmental Wisdom Worldview, as examined by Miller and Spoolman (2012, p. 25), maintains that humans are “part of, and dependent on, nature and that nature exists for all species, not just for us. Success depends on learning how life on earth sustains itself and integrating such environmental wisdom into the ways we think and act”. Through this mindset, humans recognise that resources are limited and should not be wasted, and that our success as a species depends on learning how nature sustains itself and how humans can implement the same concepts into how they think and act. Through the writings of Naess (2016), Leopold (1925, 1942, 1949) and Devall and Sessions (1985), this environmental wisdom worldview is put into a framework of principles that sensibly acknowledges the human place within the environment through a deep-rooted approach. Leopold’s ‘Land Ethic’ acknowledges the importance of the human connection to the ecological

structure of Earth. Ethics has changed with evolution and properly involves aspects of philosophy and ecology. By definition, the combination of ecology and philosophy has its origin in the tendency of interdependent individuals or groups to evolve modes of co-operation, referred to as symbioses (Leopold, 1949). Symbiosis is defined by a mutually beneficial relationship, a close association of animals or plants. Instead of a community-based ethical system that involves solely humans, the land ethic “simply enlarges the boundaries of the community to include soils, waters, plants, and animals, or collectively: the land” (Leopold, 1949, p. 192). The view of nature as a resource with limits is linked to the notion of ecosystem, and highlights the role of humans in the state of global environmental resources. This shift in mindset has human communities rethink the way things are made and grow towards a cradle to cradle design that sees waste as a malfunction. As Hawken (1993, p. 51) states:

It is not merely the environment that is being overwhelmed by toxins, it is our capacity to understand and study them. Any time a system creates by-products that harm rather than further life, it is a form of waste, and by definition, it is uneconomical. An enduring and true economy does not create waste.

6.3.3. *Nature as an ecosystem*

A biocentric worldview emphasises the interrelation of all living things and negates the Western representation of human as dissociated from nature. Many representations result from this biocentric worldview including such concepts as ecosystem, and Mother Earth and Gaia. Albrecht (2014, p. 58) also talks about the Symbiocene which he defines as “that period in the earth’s history where humans symbiotically reintegrate themselves, psychologically and technologically, into nature and natural systems”. The expression ‘Symbiocene’ is derived from the Ancient Greek *symbiosis*, literally meaning ‘living together’ or ‘companionship’. Albrecht (2014, 2016) describes the Symbiocene as an era of companionship when life on Earth is not destroyed but nurtured by humans, an era that would follow the Anthropocene. This echoes Salmon’s (2000, p. 1332) concept of kincentric ecology, in which “life in any environment is viable only when humans view their surroundings as kin; that their mutual roles are essential for their survival”. This perspective stands in contrast to the familiar human chauvinism toward other species and alienation from nature in so many contemporary human systems. From a kinship perspective, the landscapes of which humans are a part – including rocks, rivers, oceans, prominent geographic features, etc. – provide a shared sense of place and require human care and respect. Salmon further adds that the interactions that result from kincentric ecology enhance and preserve the ecosystem. As Salmon (2000, p. 1327) puts it, “interactions are the commerce of ecosystem functioning”. In the present study, representations of nature as

a subject (Mother Earth, Gaia) and nature as an ecosystem are omnipresent. They are on the opposite spectrum of a separatist view of human and nature, and are part of a biocentric worldview.

Although mentions of expressions such as Mother Earth and Gaia are few in the survey answers (US: 1 Mother Earth / AUS: 1 Mother Earth and 1 Gaia), participants undeniably refer to nature as a subject. Metaphors such as Mother Earth and Gaia are part of human narratives. Jelinski (2005, p. 271) explains that narratives, by definition, “have a narrator who picks and chooses the constraints: essentially the who, what, when, where and why in a story”. Narrators then employ the so-called facts to make events into static things (Allen, 2001). As Ettema and Glasser (1989, p. 258) point out, the narrative is meant to “transform the real into an object of desire through formal coherence and moral order that the real (otherwise) lacks”. The metaphors of Gaia and Mother Nature are examples of narratives. According to Latour and Strum (1986, p. 171), narrators “are at best inferring, at worst inventing, since they are always creating fictive or speculative accounts”. Metaphors are used to explain the connection between objects and qualities (Boyd, 1993).

Systems, processes, relations, interactions are recurrent terms in the participants’ answers. Nature is increasingly defined as a system of relations between all forms of life. Some Australian participants talk about nature as a “symbiotic relationship” between species or “the connectedness of all things”, while American participants see it as the “diverse collections of interdependent species living in sustainable and harmonious equilibrium”. This echoes the concept of *relational values* developed by Chan et al. (2016), which refers to the fact that relational environmental values are not values present in the environment per se but derivative of relationships and responsibilities to the environment. On average, while 16.5% of American participants describe nature as a system of relationships, almost double the rate (30.1%) of Australians do. “Nature is the whole living community in relationship. I think from the human perspective it is us, other humans and the more than human”, an Australian participant observes. The representation of humanity as the steward of nature is present in this context. The practice of managing and protecting so-called commons for the present but also the future generations was once widespread, but has greatly diminished as private ownership of land has become the norm (Mommaas, Latour, Scruton, Schmid, Mol, Schouten, Dammers, Slob and Muilwijk, 2017). However, in the second half of the last century, when the notion of a global ecological crisis took hold, a wider interpretation of nature as a common emerged. Terms such as ‘ecosystem services’, and ‘green capital’ became widely used. The concept of biodiversity which initially only pointed at nature’s variability, gradually also started to refer to a collective good, a common heritage of humanity which should be wisely managed. In this

perspective, nature is not seen as an object, or a collective of objects, but rather as a subject, or a collective of subjects; or in other words, as a partner of humanity with certain rights, such as a right to a 'home'. During the 20th century, certain rights for certain animals were incorporated in our legal systems. In recent times, a further shift in perception has become apparent. Various philosophers and conservationists (Nash, 1989; Stone, 2010) have stressed rights of nature in a more general sense. As an example, in 2008, the Ecuadorian constitution recognised the inalienable rights of ecosystems to exist and flourish. Furthermore, arguments have been made for widening the democratic assembly to involve both humans and non-humans (Latour, 2009).

A definition of nature coming from natural sciences offers an interesting perspective of the human-nature connection in which humans are clearly distinguished from non-humans yet are presented as interdependent parts of the whole that is nature. Ecological and conservation sciences explore nature in relation to the dynamics of the biodiversity. Biodiversity is defined as the biological variety and variability of life on Earth. It is a measure of variation at the genetic, species, and ecosystem level. This definition is used in the United Nations Convention on Biological Diversity (Harper and Hawksworth, 1994). According to Jeffries (2006), biodiversity is a maze of interdisciplinary themes that combines biological sciences but is also a reflection of a given social and political context. The survival of natural systems is often debated in the light of a human/nature separation. However, theories on biodiversity demonstrate the importance of living systems as drivers of environmental services vital to human health and security. Biodiversity supports human and societal needs, including food and nutrition security, energy, development of medicines and pharmaceuticals and freshwater, which together underpin good health. It also supports economic opportunities, and leisure activities that contribute to both physical and psychological wellbeing (Faith, Magallon, Hendry, Conti, Yahara and Donoghue, 2010; Meyer-Grandbastien, Burel, Hellier and Bergerot, 2020). In accordance with the notion of ecosystem, human beings are part of the global ecosystem that is planet Earth. And if ecological sciences distinguish humans and non-humans, it is a distinction not an exclusion. As the Nature Conservancy website puts it, biodiversity is nature by another name. And if biological diversity is the multitude of living things that make up life on Earth, this includes humankind (Dallimer, et al., 2012). Increasingly, biological sciences and studies (Fraser et al., 2016; Negi, 2010) on biodiversity extend their debate to cultural and social aspects of the human-nature bond. For instance, Clark et al. (2014) provide a framework for linking biodiversity, cultural values, human well-being and health. They argue that, while cultural pathways between biodiversity and human health are poorly understood, humans have placed cultural importance on biodiversity for thousands of years. They go further and add that biodiversity loss both negatively impact human health and human culture.

In the present study, both Australian and American findings show that nature is seen as a process of relations. Yet, an interesting and subtle difference exists between both groups. Americans do not often mention humans as included in this process of relations while Australians mention humans as part of it. An American participant asserts that nature is “everything on Earth, biotic and non-biotic that is allowed to be changed according to evolution forces without human’s disruption”. In comparison, an Australian participant integrates human to natural ecosystems: “Nature is the elements of biosphere that exist around us, both inaccessible and accessible to humankind, and we ourselves are a part of this network”. As I will keep on explaining throughout the discussion chapters, American and Australian findings diverge on the basis of a greater sentiment of disconnection for the Americans and a greater sentiment of interconnection for the Australians.

6.3.4. *On environmental sustainability*

Defining nature means understanding such terms as *natural*, *artificial* and *sustainable*, and the boundaries between them. Several survey questions triggered debates between what is natural and what is artificial as I gradually came to realise that natural and sustainable on the one hand, and artificial and human-made, on the other, were used as interchangeable synonyms. Some interview questions were about the concept of sustainability and whether nature itself, in its processes, is always sustainable. There is a difference in the participants’ understanding of their connection with nature whether it is based on their sense of self (identity) or whether it is based on human artefacts and human creations. While a majority acknowledges that human beings are nature, they mostly refuse to view human creations as natural because of their environmental impact. A majority of 78.75% participants (US: 77.50% - AUS: 80%) did not consider humans’ creations as part of nature. The reasons offered by the participants were at first straightforward: “These items are manmade” (US), “They are human-made” (US), “Things are either natural or artificial, i.e. manmade” (AUS). Underlying the natural/human dichotomy is the logic that human creations cannot be natural because they are harmful to the environment. As an American participant puts it:

They’re wrong somehow. We changed nature too much. Things with toxic components, things that don’t biodegrade, things that we expect to lie in landfills for eternity, they can’t

be nature. Nature grows. It ebbs and flows. It lives and dies and lives again. If we created something to be forever unchanging, it's like it's dead forever. That's not natural at all. Additional statements include: "They are not part of a natural ecosystem, they do not decompose" (US), "Anything that negatively impacts the natural balance of our environment on a large scale, is not part of nature" (AUS), "It is forced, it is selfish. It is detrimental and does not respect nature" (US). Environmental sustainability is related to an ethical human-nature interaction. In this respect, nature is often perceived through the lens of anthropocentrism. As Norton (1984, 1999) explains, via his theory on environmental pragmatism, there is difference between defenders of anthropocentric ethics and the supporters of nonanthropocentric ethics. With environmental pragmatism, Norton prefers to distinguish between "strong anthropocentrism" and "weak or extended anthropocentrism". He develops the idea that only the latter is capable of not underestimating the diversity of instrumental values that humans may derive from the natural world. According to Norton, what actually matters as regards the environment, is not so much taking principled stances, but rather developing rational aids to decision-making, so that the various actors can agree on what should be done and develop concrete policy measures. Participants were asked to comment the following quotation by Rolston (as cited in Oelschlaeger, 1991, p. 296):

The advice to follow nature is impossible. We could not do so if we tried, for in deliberately trying to do so we act unnaturally. If humankind is part of nature, then human actions cannot be construed as anything other than natural even if detrimental to the larger natural community.

Fifteen out of 20 participants equated unsustainable with unnatural and did not agree with Rolston's words. Yet, some participants viewed human-led destruction as a part of nature. As this Australian participant explains: "Just because we have developed technology that destroys nature, does not necessarily make us separate from nature. I believe that human civilisation is like a virus but viruses are a part of nature". Human beings are accepted as being part of nature, yet a part of nature that is harmful to the rest of nature. "We are nature. There is no distinction. But, a bit like cancer, we can behave very destructively outside the natural order of things. That doesn't make us not nature. It just makes us out of balance", an Australian participant argues. When accepting the basic definition of 'natural' provided by the dictionary as "existing in or derived from nature, and not caused by humankind", equating sustainable and natural reveals yet again the predominance of the human/nature split in the contemporary understanding of the environment. Comments on Rolston's

quotation from both groups of participants were emotionally charged as they could not reconcile destruction with nature. Indeed, what would it imply if, as an American participant phrases, we came “to believe that even the machinations of humans are ‘of nature’”? That would imply accepting that humans are nature, and that nature can be, through the acts of humankind, self-destructive. Nature destroying itself.

According to Morelli (2011, p. 2), the term *sustainable* has become a corporate buzzword, applied so commonly that it is “a synonym for everything that is positive”. Current definitions of the concept include Goodland (1995) who describes environmental sustainability as “the maintenance of natural capital” and as a concept apart from, but connected to, social and economic sustainability. Likewise, Morelli (2011, p. 6) defines sustainability as “meeting the resource and services needs of current and future generations without compromising the health of the ecosystems that provide them”. Callicott and Mumford (1997), who developed the meaning of the term ‘ecological sustainability’ as a useful concept for conservation biologists, confirm a definition that connects human needs and ecosystem services, meeting human needs without compromising the health of ecosystems. In this respect, ecological sustainability does not refer to a form of nature that may compromise the health of ecosystems.

6.4. The expressive dimension of nature: Aesthetism and emotions

The Oxford English Dictionary (2012) defines the term ‘aesthetics’ as “the branch of philosophy which deals with questions of beauty and artistic taste”. In the 18th century, Baumgarten (1983) used the term aesthetics for the first time for denoting ‘the science of the sensory’, that is, the recognition we extract from dealing with the senses. As Breiby (2014, p. 165) points out, “experiences of nature provide one the opportunities to discover, express, and perceive aspects of reality that lie at the root of our existence and make life valuable, joyful, and sometimes painful”. Aesthetic values are a large part of what draws people to environmental activities and issues. Studies show the connections between natural environments and human emotions as nature experience has been praised for promoting awe and other positive emotions (Albrecht, 2018; Ballew and Ornoto, 2018). The present study confirms that contact with nature elevates positive emotions, such as happiness, joy, and feelings of awe. According to an American participant, “nature is the beauty of the planet, that humans are bound to protect and coexist with”. Terms such as “beautiful”, “wonderful”, “joyful” are often associated to natural places when participants describe their personal experiences: “beautiful forests and meadows”

(US), “beautiful and wild” (US), “the wonderfulness of the natural world” (US). Mental wellbeing, as Albrecht (2019) observes is directly linked to nature exposure. For example, some studies suggest that a short walk in a natural setting, as opposed to urban or indoor settings, can increase positive emotional states (Berman et al., 2012; Mayer, Frantz, Bruehlman-Senecal and Dolliver, 2009). Likewise, Passmore and Howell (2014) argue that people who had ongoing contact with nature over two weeks, such as taking a walk in a park, had significant increases in positive affect and feelings of elevation. This mirrors the experience of this Australian participant who was struggling with mental health problems:

I was living in Sydney city for many years and found I was slipping into a deep depression. I tried many different medications and remedies. I decide to take a holiday to Cairns to get away from the city for two weeks. Within a week of bushwalking, visiting the reef and experiencing the beautiful waters around Cairns, my depression disappeared.

According to Capaldi, Dopko and Zelenski (2014), mental wellbeing and nature connectedness are also linked to one’s sense of identity. An American participant tries to illustrate the feeling resulting from too much urban time and not enough nature time as related to the sense of self: “It feels like a layer of myself is being peeled away. Or a layer of slime or dirt is covering me”. A majority of participants from both countries equate urban settings with stress and a form of mental restlessness: “Spending too much time in non-green spaces is often frustrating, and tends to make me irritable, unfocused, and anxious”, an American participant explains. Experiences with the natural world through mere exposure to nature photos (e.g., pictures of mountains and forests) as well as direct interaction with nature (e.g., nature walks, hiking) provide cognitive, affective, and behavioural benefits. For example, research indicates that contact with natural settings, as opposed to built settings with human-made characteristics such as buildings and cityscapes, can promote physical health (Lee, Park, Tsunetsugu, Kagawa and Miyazaki, 2009; Ulrich, 1984) as well as a broadened sense of connectedness to all forms of life (Passmore and Holder, 2016). The following words from an American participant illustrate the awe experienced with natural environments as opposed to urban settings:

A pond is bursting with the movement of small fish, insects, and rippling water. A building is stationary, unchanging. It is easy to be depressed in a grey box of a room. It is much harder to be depressed in a forest, especially if it is a old-growth forest in all of its rich glory.

This quotation also illustrates Dewey’s (1934) statement that an aesthetic experience is a result of the interaction between nature and the individual.

Interestingly, as Brown, Barton and Gladwell (2013) state, merely viewing nature pictures promotes mental health. The Internet has become a common tool to view pictures of nature (“all the beautiful things of nature you see on social media”, AUS). Several participants acknowledge the power of nature images online. “It’s just so beautiful and I’m enamoured by it, so for me digital technology allows me to

continue to celebrate nature even when I'm not outdoors" an Australian participant shares. To some extent, online experience of digital nature may prompt nature exposure in real life: "I see some beautiful pictures of nature on the Internet but all it makes me want to do is be out in it" (AUS). Yet, as this Australian participant observes, nature images are helpful but they have their limits:

I think it's great to see nature through TV, places you have never seen. Animals living, trees time lapsed. It does leave you with awe. Though I don't believe it gives you a deeper relationship with nature. I think that comes from within.

Indeed, a deeper relation that "comes from within" can be related to what Bethelmy and Corraliza (2019) call "transcendent and sublime" experiences. The Sublime Emotion toward Nature (SEN) scale that they use includes both awe and inspiring energy as key concepts. Bethelmy and Corraliza (2019) define awe as feelings of fear, threat, vulnerability, fragility, and respect for nature, which is perceived as vast, powerful, and mysterious, and they define inspiring energy as feelings of joy, energy, oneness, freedom, and harmony with the universe. When observing how urban time and nature time can differ, this Australian participant shows how awe is triggered by awareness of something larger than the self and not immediately understandable, which may be linked to spirituality:

I don't feel connected to my physicality the way that I do when hiking, swimming in the sea or exploring. I think it also comes from the spiritual yearning to be awed by something great. For me nature is a spiritual place and I long to go places where I can simply be.

One of the key features of awe is that it promotes what is called 'small self,' a healthy sense of proportion between one's own self and the bigger picture of the world around. In a study by Sturm et al. (2020), volunteers were instructed to take weekly outdoor walks and take selfies at the beginning, middle and end of each walk. Individuals in the awe group increasingly made themselves smaller in their photos to focus more on the landscapes around them. At the same time, the smiles on their faces grew noticeably more intense. Additionally, a study by Yang, Hu, Jing and Nguyen (2018), which examines the relationships between people's feeling of awe, their connectedness to nature, and pro-environmental behaviours, indicates that awe helps broaden the self-concept by including nature and increases connectedness to nature, which in turn leads to pro-environmental behaviours.

The aesthetic dimension of nature reflects in the extensive research on tourists' preferences for nature and different types of landscapes (Hazen, 2009; Raadik, Cottrell, Fredman, Ritter, and Newman, 2010). Studies show that central dimensions are 'scenery' (Hazen, 2009), 'clean environment' (Coghlan and Prideaux, 2009), 'beautiful/dramatic landscape' (Haukeland, Grue and Veisten, 2010), and 'silence/peacefulness' (Raadik et al., 2010). In the present study, a majority of participants from both countries mention the feeling of harmony when they suggest aesthetic dimensions of nature. Some participants use the words 'balance', 'coherence' and 'belonging'. Previous studies that place harmony as a

central dimension (Hosany and Witham, 2009; Oh, Fiore and Jeoung, 2007) support this observation. One of the Australian participants describes the coherence between nature and human-made environments as follows: “Just as some people find peace in a church, I find peace by being in a natural environment on my own”. Breiby (2014) further adds specific aesthetic dimensions of nature such as a human-made environment that does not compete with nature (harmony), experiencing variation in landscape (mountains, rivers, etc.), experiencing both silence and sound (waterfalls, wind, etc.) (contrast), experiencing unpolluted nature, fresh air, clean water (genuineness), or viewing beautiful landscapes from the road (scenery). All of these categories can be found in the participants’ answers.

An aesthetic experience of nature is more than the visual and passive receiving of stimuli. Human and nature are engaged in an ever-changing relationship. The concept of an expressive (aesthetic) dimension of nature can be understood as how the individual experiences nature through an active interplay of senses. Central key words from the interviews are perception, feelings, beauty and peace. The results support Baumgarten’s (1983) definition of the concept of aesthetics as the science of the sensory. They also indicate that aesthetics is a multifaceted concept that implies a general sense of learning. Tordsson (2006) confirms that the concept of aesthetics is about actively sensing. The following testimony by an Australian participant illustrates this:

Nature was an integral part of my upbringing. It helped me feel less afraid of or alienated from it.

Walking around barefoot on hot red dirt, seeing snakes and spiders, swimming in the surf every summer and learning about the ocean also contributed to a respect for the natural world and its resources, such as water. Witnessing animals dying, the effects of the drought and the preciousness of water had a profound affect on my feelings towards the natural world.

Just as participants welcome the experience of nature, they tend to block out the overwhelming stimuli from the urban world. Doing so, they might eventually be subjected to what Breiby (2014) calls ‘sensory numbness’. In this respect, an orientation toward experiences in nature and a longing for nature exposure might enhance the senses. Whether in their childhood or adulthood, participants maintain the importance of experiencing nature on their own. As an Australian participant shares:

As a child, I felt that nature was somewhere I could feel free and somewhere where I belonged. I wasn’t under the surveillance of parents or other authority figures. Having the opportunity to enjoy nature as it was – unshaped and unruly – was also important in fostering a feeling of connection.

As an American participant adds: “Most times, I find solitude in nature and I feel a calm belonging”. Likewise, one of the Australian participants explains that nature is a place “where I feel I can breathe safely and be alone for extended periods of time”. Many participants also agree that experiencing extraordinary viewpoints whether in real life or via photographs is not essential to feel a connection to the greatness of nature. They praise the beauty of “ordinary”, “rustic”, “everyday” nature that can be found in their

backyards. They also underline the importance of native plants and of feeling integrated into the local or territorially anchored environment. One of the American participants defines nature as follows: “It is spatially and temporally contextual, as well as completely subjective. To me, nature is generally outdoors surrounded by diverse species native to whatever region I exist within”.

6.5. American and Australian similarities and differences and conclusion

American and Australian results validate the definition of nature according to the three following dimensions: cognitive, normative and expressive. Both groups of participants juxtapose anthropocentric views of nature as human-exclusive and biocentric views of nature as human-inclusive. Biocentric views are predominant – the participants of the study being pro-environmental individuals – but anthropocentric views, however minor, are present nonetheless. Within these different worldviews, participants acknowledge their relation to nature via the physical expressions of nature (cognitive dimension), their ethical values toward nature (normative dimension), and their emotional and aesthetic bond to nature (expressive dimension). As Mesle (2009) observes, our own existence is inseparable from the world around us. The study’s findings confirm that nature can only be experienced and understood within a specific context, at a particular time and in a particular culture. There is no nature without a conscious eye to witness it. This echoes Oelschlaeger’s (1991, p. 350) hypothesis that “we are nature watching nature” and that “if nature is just a fabrication of the knowing mind, then we are just watching ourselves”. The study’s results confirm that nature is contextual and dependent on the geographical and environmental realities of each country. The main difference between both groups regarding the cognitive dimension of nature is the concept of the bush, which is typically Australian and nonexistent in the US. The bush as a physical expression of nature represents an accessible, even mundane, form of wilderness, and implies that Australian participants have a stronger connection to, and less dichotomised perception of, wild nature. In comparison, Americans tend to view urban nature as accessible and wilderness as entirely devoid of humans, thus out of reach. Participants from both countries have the same ethical values toward nature, sharing such concepts as sustainability and representations of nature as a resource or an ecosystem. The main difference between both groups regarding the normative dimension of nature is the concept of nature as God’s creation, which is important in American findings and inconsequential in Australian findings. Finally, both groups had similar aesthetic and emotional experiences of nature, sharing feelings of wonder, awe, peace, freedom and joy when in nature, enjoying the beauty of nature and often equating it to a spiritual experience. They confirmed the many studies assessing the values of nature on physical, emotional and mental health. These findings show that both Americans and Australians entertain a positive, healthy and nourishing relationship with nature based on respect and love. Both groups understand nature as a network of relationships and

interactions between all living things, and as an evolutive, ever-changing process rather than a static domain of things that has to be preserved and to which humans are estranged. The results also show that culture influences how nature is perceived and as a result related to, and that, depending on different national origins, the human-nature relationship can vary. Both groups of participants share the commonalities of the pro-environmental trend and it is important to clarify that as pro-environmental individuals, they represent a very specific minority that is not representative of American and Australian wider cultures.

7. Discussion Part Two: Culture

At the root of the ecological crisis are the values which have built our society.
(Swan, 1971, p. 225)

7.1. Introduction

Recognition of the cultural character of nature and tying the human and natural domains together imply that the way we perceive nature is part of a larger cultural discourse, which is continuously changing. Western culture as the main reference reveals how American and Australian cultures share similarities but also offer differences in the age of globalisation. It shows the influence of Native American culture in the United States and Aboriginal culture in Australia in participants's views of nature, and how both countries have developed a somewhat similar environmental culture. Although the West as a geographical area can seem unclear and undefined, it applies to countries whose histories are strongly connected to Europe by immigration or colonisation – and this includes Australia and the United States. I first wondered about the notion of culture as a co-created reality – or more precisely, a socially-created, self-endorsed filter that we apply to our experience of reality. But, eventually, I came to wonder whether there is anything that we do that is not learned and culturally inherited. Is there any thought, behaviour or action that we did not take from the society we live in and that is truly ours? This chapter will explain how culture is based on worldviews and collective beliefs; how, as an ongoing process of interactions between the society and individuals, it both determines individuals and is, in turn, shaped by them; and how nature influences culture and both natural and human systems have conditioned a global pro-environmental culture. As Hofstede (2001) observes, culture is to a society what personality is to the individual. Culture lies between our shared humanity and our unique personalities, and is shaped both by human environments and natural environments.

7.2. Shifting worldviews: From the Dominant Social Paradigm to the New Environmental Paradigm

Are our attitudes towards the environment learnt? Is there such a thing as an apprenticeship of the human-nature relation, an environmental culture which would be tied to a specific time and civilisation? I argue that our relation to nature is a mirror of our culture and the society we grow up in. According to Moore (1975), the culture concept makes sense as an ideology which is part of a belief system. Participants to the present study share similarities in their views and their beliefs on nature that go beyond the American and

Australian borders and seem to be common to Western culture in general. They also offer differences and both groups represent minorities of pro-environmental trends in the larger context of the American and Australian societies. If culture can be described as the heritage of social norms, ethical values, belief systems, artifacts and technologies of a society, then environmental culture can be described as the heritage of social norms, ethical values, belief systems, artifacts and technologies of a society regarding the environment. As the theme on environmental education (see chapter 5, point 5.3.3) shows, participants' relation to nature was part of their upbringing and they inherited values, attitudes and behaviours toward nature from their family and extended social environment. I will start by explaining the difference between environmental attitudes and environmental behaviours. Environmental attitudes have been defined as "the collection of beliefs, affect, and behavioral intentions a person holds regarding environmentally related activities or issues" (Schultz, Shriver, Tabanico and Khazian, 2004, p. 31). This definition makes clear that environmental attitudes are positions or orientations that pertain specifically to environmental issues or activities rather than to life and reality in general. While environmental attitudes are reflections of one's internal life and part of the mental realm (e.g., feelings, opinions, ideas, orientations), environmental behaviours – also known as pro-environmental behaviours (PEBs) – are reflections of one's external life and part of the physical realm, they are, concrete or measurable (e.g., frugal, altruistic, and equitable actions) (Verdugo, 2012). Such behaviours thus involve aspects of individual lifestyles – such as consumer and dietary choices, use of energy and transportation, support for policy measures, and contributions to societal change. These pro-environmental values, attitudes and behaviours are part of a belief system, or what is also known as worldviews. Ronnow (2011) confirms that environmentalism, from preserving pre-industrial landscapes, advocating the intrinsic value of nature, and protecting ecosystems against overexploitation, has developed into a worldview, ethos, and practice, that is radically shifting the frontiers of politics, economics, and ethics. Tarnas (2007, p. 16) explains the importance of worldviews in shaping reality as follows:

Our world view is not simply the way we look at our world. It reaches inward to constitute our innermost being, and outward to constitute the world. It mirrors but also reinforces and even forges the structures, armorings, and possibilities of our interior life. It deeply configures our psychic and somatic experience, the patterns of our sensing, knowing and interacting with the world. No less potently, our world view – our beliefs and theories, our maps, our metaphors, our myths, our interpretive assumptions – constellates our outer reality, shaping and working the world's malleable potentials in a thousand ways of subtly reciprocal interaction. World views create worlds.

Environmental worldviews, values, attitudes, and discourses represent a specific worldview within the dominant Western worldview. Dunlap and Van Liere (1984, 2008) talk about the New Environmental Paradigm (NEP) and the Dominant Social Paradigm (DSP). The NEP can be defined as the view that humans

represent only one among many species on Earth, that human activities are determined by the environment as well as by social and cultural factors, and that humans are strongly dependent upon the environment and its resources. The NEP contrasts the DSP. The paradigm shift from the DSP to the NEP shows that worldviews are part of the transformation process toward sustainable societies (Hedlund-de Witt, 2013). It also indicates that culture plays a role in global environmental challenges. While participants to the present study grew up within the DSP, through pro-environmental relatives, environmental education, specific environmental media subjects, nature exposure, etc., they developed an environmental worldview, this paradigm shift representing a profound change in a fundamental model or perception of events. Kuhn (1962) argues that a paradigm shift arises when the dominant paradigm is rendered incompatible with new phenomena, facilitating the adoption of a new theory or paradigm. For many participants, this new phenomenon was the environmental crisis which made them change to a more environmentally friendly lifestyle (“I was living in Ohio where they were fracking, that was an environmental disaster”, US - “What made me change was the War on Waste series on ABC TV several years ago, seeing how much we generate landfill and the amount of plastic in the oceans”, AUS).

The pro-environmental participants to this study challenge the dominant social paradigm (DSP) by questioning its underlying assumptions, resulting in tensions or conflicts. Pirages (1977, p. 6) defines the concept of the DSP as the “constellation of common values, beliefs, and shared wisdom about the physical and social environments which constitute a society’s basic worldview”. As Dunlap and Van Liere (1984, p. 1013) contend, “transmitted from generation to generation via institutional socialization, a DSP forms the core of a society’s cultural heritage”. The following themes are strong centrepieces of the DSP: ownership of land, individuality, unlimited economic growth, domination of nature, and technological development (Milbrath, 1985; Shafer, 2006). Kilbourne, Beckmann and Thelen (2002) observe that research on environmental issues can fail to examine the underlying mechanisms determining environmental beliefs and attitudes. They claim that socially constructed cultural traditions that reflect the dominant worldview (DSP) of a society play a pivotal role in the determination of individual beliefs and attitudes on environmental issues. The following table displays the different beliefs and values associated with the New Environmental Paradigm (NEP) and the Dominant Social Paradigm (DSP).

Table 7.

Contrasting DSP and NEP

Dominant Social Paradigm		New Environmental Paradigm	
Low valuation on nature	Use nature to produce goods	High valuation on nature	Worshipful love of nature
	Human domination of nature		Human interrelated with nature
	Economic growth over environmental protection		Environmental protection over economic growth
Compassion only for those near and dear	Exploit other species for human need	Generalised compassion	Toward other species
	Concern for this generation only		Toward other peoples and other generations
Technology to maximise wealth	Science and technology great boon to humans	Careful technology	Science and technology not always good
	Emphasise hard technology		Develop and use soft technology
Present society all right (keep DSP)	Humans not seriously damaging nature	Aim for a new society (new paradigm)	Humans seriously damaging nature and themselves
	Competition and materialism		Cooperation and postmaterialism
	Complex and fast lifestyles		Simple and slow lifestyles
	Emphasis on market		Emphasis on public goods
	Emphasis on jobs for economic needs		Emphasis on worker satisfaction in jobs
No limits to growth	No resource shortages	Limits to growth	Resource shortage
	Production and consumption		Voluntary simplicity and conservation

In the 21st century, the NEP, while being a key pro-environmental worldview, has also been nuanced and challenged by more recent views such as techno-optimism and the negative growth trend or degrowth movement (Alexander, 2012). Climate change and environmental degradation present challenges that require innovation to resolve. Techno-optimists favour technology that can

replace fossil fuels with clean energy sources, make methods of food production more efficient and sustain global transports without burning petroleum or coal (Bove, 2021). Innovation is key. Likewise, green growth is a term to describe a hypothetical path of economic growth that is environmentally sustainable. It is based on the understanding that as long as economic growth remains a predominant goal, a decoupling of economic growth from resource use and adverse environmental impacts is required (Allan and Meckling, 2021). As such, green growth is closely related to the concepts of green economy and sustainable development. A main driver for green growth, as well as for techno-optimism, is the transition towards sustainable energy systems. For instance, Jackson (2009) calls on Western countries to shift their economies from mass-market production to local services – such as nursing, teaching, and handicrafts – that could be less resource-intensive. Jackson does not underestimate the scale of the changes, in social values as well as in production patterns, that such a transformation would entail, but he thinks that people can flourish without endlessly accumulating things and possessions, and that another world is possible. However, some researchers (Parrique, Barth, Briens, Spangenberg and Kraus-Polk, 2019) argue that there is no empirical evidence supporting the existence of a decoupling of economic growth from environmental pressures. They explain that the validity of the green growth discourse relies on the assumption of a permanent, global, large and fast enough decoupling of economic growth from all critical environmental pressures, which is not realistic in the near future.

The DSP has been the guiding structure under which Australian and American participants formed their identities from childhood to adulthood. Within this dominant paradigm, they forged, throughout the years, an alternative worldview, influenced by their families and their upbringing, which redefines the human-nature interaction from a respectful, compassionate and spiritual perspective. While the DSP may not receive universal endorsement and is often criticised, it still is an influence on the participants' everyday lives. For some participants, living in a capitalist Western country and relying on all the technologies that it provides while holding strong environmental values is difficult and may appear paradoxical. The following words from an Australian participant encapsulate this paradox:

I could consider nature as my home if I could exist with it harmoniously but I cannot imagine how that is possible whilst being reliant on any form of technology. Westerners can choose to return to nature, to live in nature without technology. I suspect that it is beyond most people though... I find it difficult to imagine any Western lifestyle that could be deemed truly sustainable. I believe that a Western lifestyle will always consume resources at a faster rate than the planet can replenish.

An important reason for exploring worldviews in the context of nature representations is their implications in global environmental and sustainability issues. Environmental philosophers tend to see worldviews (and frequently Western worldviews) as ‘root-cause’ of sustainability issues, and a profound change in them therefore as crucial to the process of forging solutions. Researchers (Du Nann Winter and Koger, 2004; Gifford, 2011; Inglehart, 1995) argue that a change of individual lifestyle is an essential element in the transition towards more sustainable societies, and an understanding of worldviews appear to be important in this process. Culture can be seen as the filter through which one perceives nature. This is why, as the concept of cultural relativism explains, a person’s beliefs, values, and practices should be understood based on that person’s own culture, and not be judged against the criteria of another (Hartung, 1954; Tilley, 2000). Boas (1887, p. 589) articulates this idea as follows: “civilization is not something absolute, but is relative, and our ideas and conceptions are true only so far as our civilization goes”.

7.3. Collective belief and cultural behaviour

Participants share such environmental worldview as the NEP within a different dominant Western worldview such as the DSP. This shows that worldviews can evolve, and that culture, when transformed, starts from within and spreads from the individual to the community. Human behaviours are part of a culture, and culture works as a collective belief system. Culture refers to the way we understand ourselves as individuals and as members of society, including stories, religion, media, rituals, and even language itself. It has been described as the non-biological or social aspects of human life, meaning that there is no culture outside society. The concept of symbolic culture is interesting in this respect. Symbolic culture, or nonmaterial culture contrasts with material culture. It involves physical entities of cultural value and includes the creation, usage and trade of objects (Watts, 1999). Symbolic culture is a domain of objective facts whose existence depends, paradoxically, on collective belief. A currency system, for example, exists only for as long as people continue to have faith in it. When confidence in monetary facts collapses, the ‘facts’ themselves suddenly disappear. Much the same applies to citizenship, marriage, government, and many other things that people in our own culture consider to be ‘real’. For many participants to the present study, a fact often considered as ‘real’ is that humans and nature are separate. Yet, within the NEP, the human/nature dualism is one of the first thing reconsidered. As this American participant explains – via the concept of *magic wall* – a divide between humans and nature is often presented through education and socialising as a hard truth when it is actually a collective belief that humans fortify generation after generation:

A magic wall is a wall between humans and everything else – a wall which frees us from accountability, dependency, and responsibility towards those beings on the ‘other side’. A magic wall allows us to disregard, manipulate, and exploit other beings, to appoint ourselves dictators or stewards, to say, ‘humans first, humans always’. But there is no magic wall. So, what does that mean for how we are in the world?

The study’s findings on the predominance of the human/nature dualism in the participants’ answers confirm that culture is based on beliefs that are shared collectively. As many academics (Callicott and Nelson, 1998; Cronon, 1995; Oelschläger, 1991) have shown, beliefs on a human/nature separation are part of Western culture and transmitted from generation to generation. They are not a truth in itself, just a truth at a precise time for a precise society. They are part of learned cultural behaviours.

Cultural behaviour is behaviour exhibited by humans that is extragenetic, in other words, learned (Henrich, 2015). For a behaviour to be considered cultural, it must be shared extragenetically, that is, it must be taught. In the present study, a culture of the environment, or environmental culture, was transmitted to the participants by their families but also by media and education. Participants learned earlier on the importance of recycling, how to grow plants, how to distinguish between the diversity of species and their role in the ecosystem, etc. If nature exposure is key in developing a bond to natural environments (see point 7.5), culture is also key in generating PEBs. Chwialkowska, Bhatti and Glowik (2020) show how cultural values can influence the relationship between environmental concern and pro-environmental behaviour, and thus mitigate the ‘green gap’ – the gap between environmental intentions and environmental actions. Such cultural values require a form of human civilisation based on ecological principles.

A majority of what humans do – the languages they speak, the technology they use and so on – is learned, or otherwise inherited, from the cumulative knowledge of their society (Kempe, Lycett and Mesoudi, 2014; Richerson and Boyd, 2005). This is what is known as *social learning* – learning by observing or interacting with others (Heyes, 1994) – as opposed to *individual learning*, whereby novel solutions to problems are the products of single individuals (Mesoudi, 2014). The shift from the DSP to the NEP seems to contrast social and individual learning because environmental values are not predominant in Western culture. Pro-environmental values may be described as a form of counterculture by which people must develop an independent way of thinking. Indeed, the countercultural rebellion of the 1960s has been an important force backing environmental causes. It led to a ‘return to the land’ and the development of alternative lifestyles, and was a pioneering effort towards finding a more viable relationship between humans and their environment (Dasmann, 1974). Some participants who have engaged as adults in a pro-environmental lifestyle or activity inherited the 1960s counterculture values from their parents (“I grew up in a pretty environmentally conscious home”, US - “Growing up our mother taught us to recycle, how to

reuse items and how to care for our plants at home”, US). Many participants were inspired by 1960s hippy communities and idealised the counterculture revolution and ‘back-to-the-land’ movement. Even though modern societies place a high value on economic prosperity and cultural values which promote the acquisition of wealth and material possessions, there is increasing concern about the environmental damage engendered by current levels of consumerism (Jackson, 2009). If the NEP is not the predominant worldview, it is still part of Western culture, and Western culture itself made this environmental paradigm possible. Pro-environmental communities such as the ecovillages or community gardens that some participants were part of are potent ways to strengthen pro-environmental values and foster pro-environmental actions. As Bar-Tal (1990) observes, individuals who live in groups hold common beliefs which define their reality, not only as persons, but also as group members. And group beliefs are shown to have important behavioural, cognitive, and affective implications for group members and the group as a whole. They may contribute to the behavioural direction a group takes. Those participants would use the opportunity to be part of a community as a catalyst for a change they would not have achieved by themselves. The following words by an Australian participant illustrate this: “When I saw the Ecovillage at Aldinga, I recognised that it could fulfil my desire to be part of a community that cares about each other and the future of the planet”.

People adjust themselves to the society by becoming familiar with its beliefs and applying these beliefs in their daily life. As Orlean (2004) explains, group belief is closely dependent on the cultural and historical context that shapes the identity of the group. Gilbert (1987, 1996) argues, via her plural subject theory, that groups are real entities and are symbols of human interactions. Participants to this study confirm the definition that Sheehy (2002, p. 377) provides of groups as formed by individuals “who share a commitment to certain ends, intentions, attitudes, or actions and that commitment is common knowledge among them”. The pro-environmental participants represent a certain kind of group within the wider and more general group that we call society. The plural subject theory further posits that individuals “make the commitment as a unit or body or whole” (Sheehy, 2002, p. 377). This is confirmed by the findings because pro-environmental groups do act as a whole, which may appear as being individually-led but is strengthened as a group, or unit, via the use of digital technology. One of this study’s findings is that digital technology – as it is the case with American and Australian participants – enables pro-environmental persons from different countries and backgrounds to connect, meet virtually and share their commitment to protecting the environment.

The potential of the Internet to enhance civic participation has been examined in numerous theoretical and empirical studies (Beck, 1997; Feenberg, 1999; Giddens, 2013). Bakardjieva (2009) coined the term subactivism to demonstrate how small-scale decisions and actions of individuals form a type of politics which is increasingly conducted via social media. Bakardjieva (2009) explains that these forms do

not square neatly with elevated notions of political and civic participation and that their significance may escape recognition, but that they should count as civic engagement. An Australian participant argue that individual pro-environmental actions are to be considered civic activities that evolve at the level of everyday life, and that they can be nurtured by social media:

I'm on social media, and I read green left weekly newspapers or journals of social actions. Just like nature, social media broadens my landscape of interactions and engagement, and inspires me with doable solvable actions. I love direct action, writing letters to politicians, and non-violent civil disobedience.

Participants did not necessarily define themselves as activists even if they were engaged in the nature conservation debate via their lifestyles or their activities. Many consider the best approach toward environmental conservation to be lifestyle-based, and would first shift toward ecologically-friendly everyday habits. This made me question whether participants should be labeled environmental activists or environmental advocates. Cohen (2004, p. 9) defines advocacy as follows: "To be an advocate and to engage in advocacy is to adopt a stance, advance a cause, and attempt to produce a result in behalf of an interest of a person, group, or cause". With the rise of the Internet and of social media, a majority of participants became public communicators on climate change and various environmental issues, and their communications can sometimes attract disproportionate attention. Schmidt (2015, p. 70) claims that online public statements on environmental conservation "are inevitably advocacy for some position, view, or outcome". The difference between activism and advocacy can seem unclear. According to Lewis (2018), "To be an activist is to speak. To be an advocate is to listen. Society can't move forward without both". Parsons (2016) further argues that an activist is someone who tries to draw public attention to an issue that they consider to be important (i.e. a concern not necessarily science-based or valued by society). This typically involves trying to convert an unaware or uncaring public into a public that is aware of the issue. Activism seems to be somewhat more aggressive than advocacy. For instance, participants to the study who were part of the Zero Waste movement would use both terms interchangeably ("I advocate for a less wasteful life in my community", "I thought that becoming a zero-waste activist was the way to go"). Bakardjieva's (2009) concept of subactivism can be seen as a form of self-advocacy. Most participants to the study, even when they did not define themselves as activists, were self-advocates sharing the following characteristics: learning how to speak up for oneself, making one's own decisions about one's own life, learning how to get information so that one can understand things that are of interest, finding out support, knowing one's rights and responsibilities (Daly-Cano, Vaccaro and Newman, 2015). Like subactivism, these characteristics involve small-scale decisions and individual actions increasingly conducted via the Internet and social media.

7.4. Culture and the self

7.4.1. *Self-construals*

Pro-environmental trends appear as an aim to dissociate from traditional Western environmental views. A majority of American and Australian participants overtly criticised Western society's perceptions of nature and the resulting actions towards it. When doing so, they usually refer to the society as "they" and tend to exclude themselves from the rest of the community of which they are part. "Yes, I think that modern humans are separate and distinct from nature but it is by choice and one can return to nature if they wish", an Australian participant explains. Likewise, this American participant thinks that "humans used to be deeply connected to the natural world in ways Westerners have completely lost. I am saddened that these connections have been severed. Spending time outside naturally calms humans". Culture, self and instinct, and their roles in human behaviours are key themes in understanding the human-nature relation. This point, related to the nature/nurture debate, is raised because instinct and an instinctual drive toward nature were part of the participants' answers. Boyd and Richerson (2006, p. 1) argue that "something makes our species different, and that something is cultural adaptation". Over the last million years or so, humans evolved the ability to learn from other humans, creating the possibility of cumulative, non-genetic evolution. Yet, on questioning whether culture is shaped by human innate tendencies and capacities (instincts), Josey (1922) argue that the behaviour and desires of an individual are determined by the relation he/she sustains to his/her environment. As explained in chapter 5 (point 5.3.3), participants acknowledged three influences in their relation to nature and their environmental education: human influence (i.e. family, media, school), natural influence (via nature exposure and nature experiences), and internal influence (instinct). On further analysis, natural and instinctual influences appear to be related as nature experience tends to strengthen one's connexion to oneself and to one's instinct. The *New World Encyclopedia* defines instinct as "the inborn disposition of a living organism toward a particular behavior or pattern of behaviors, characteristic of the species". But instinctual behaviours are always contextual and as Josey (1922) confirms, these particular behaviours are often reactions to environmental stimuli. The findings to the present study indeed show that environmental values, and environmental education, are nourished by the stimuli which are natural and human environments.

Culture is related to the concept of the self and what Markus and Kitayama (1991) term *self-construal*. Self-construal is the process of the relationship that develops between one's own self and others. As Kelly (1955) states, one's concept of self shapes one's vision of reality. He argues that individuals

construe the meaning of events through an abstraction process and by placing constructions upon the experiences. These interpretations, or construals, according to Kelly (1955), are one's reality. The self exists in relation to others. DeCicco and Stroink (2007) think that the interpersonal aspect of construing the self allows one to examine selfhood by examining the self in social context. Most psychologists continue to hold the Western view of the individual, that is, the view of an independent, self-contained, autonomous entity (Markus and Kitayama, 1991). But as DeCicco and Stroink (2007) explain, there are three different cognitive representations of the self that people may hold: independent self-construal, interdependent self-construal, and metapersonal self-construal. Persons with an independent self-construal view internal attributes, such as abilities, values, and attitudes as central to their sense of self. Those with an interdependent self-construal, in contrast, view their close relationships, social roles, and group memberships as central to their sense of self (Giacomin and Jordan, 2017). Contrary to the first two categories which are bound by personal attributes or defined only by social context, the metapersonal self-construal extends beyond the individual and close others (Westen, 1996). According to Ho (1995), this orientation is decentred and free from egocentricity in that the individual is not focused entirely on the self or on ego-focused needs. This process occurs via what Baumeister (1998) calls *reflexive consciousness*, which develops when an individual reflects on others or things, and sees them as part of the self. For example, the way participants to the present study view nature as part of themselves may reflect the metapersonal self. They offered self-representations who refer not to individual attributes (independent self), nor to relationships and social groups (interdependent self), but to an essence beyond the individual and others, and to a universal focus ("I feel deeply connected to the natural world" - US, "I am part of life in all its forms" - AUS).

This orientation of the self is important in fostering healthy relations with the natural environment in a Western context. Western culture has been described as an individualistic, rather than a collectivistic, culture (Moza, Lawrie, Maricutoiu, Gavreliuc and Kim, 2021). Its liberal and neoliberal dimensions also emphasise that individualism (MacDonald, 2019). A study by Komatsu, Rappleye and Silova (2019) found that individualistic cultures are worse for the environment and are less eager to take responsibility for their impacts on nature. On the other hand, strong nature connections, which are related to the metapersonal self-construal, are associated with greater pro-environmental behaviours. A study by Geng, Xu, Ye, Zhou and Zhou (2015) shows that when people care more about and feel more connected to nature, they will be less apt to act in ways that harm it. Likewise, in an attempt to determine whether individual differences in self-construal predict differences in environmental concern, resource sharing, and pro-environmental behaviour, Arnoky, Stroink and DeCicco (2007) found that the independent self-construal uniquely predicted egoistic environmental concern and competitiveness in sharing resources. The interdependent self-construal

predicted resource cooperation, and the metapersonal self-construal predicted biospheric environmental concern, ecological cooperation, and self-reports of environmental conservation behaviour.

The concept of metapersonal self is related to what Belk (1988) calls the *extended self-concept*. Developed from psychology and sociology, the concept of self extension means that an individual's concept of self can extend outside the body (Belk, 1988). As Clark and Chalmers (1998) ask, "where does the mind stop and the rest of the world begin?". They argue that interfering with someone's environment will have the same moral significance as interfering with their person. McKinnell (2011) further argues that environmental degradation can be related to a fragmentation or violation of personal identity. The present study's findings confirm those arguments in relation to the concept of solastalgia (Albrecht, 2005, 2010, 2019). Comments such as the following by an Australian participants were frequent:

Living in cities does this to me. I feel trapped, a little panicked, and like I can't access my physical body. I don't feel connected to my physicality the way that I do when hiking, swimming in the sea or exploring.

While the theory of the extended self has been applied to understanding relationships with tangible possessions, the theory's application to intangible objects such as nature remain scant. Kunchambo, Lee and Brace-Gova (2017) reveal three dimensions of the self-nature relationship: the relational extended self, the encapsulated self and the assimilated self. These dimensions illustrate the different levels of intensity in the self-nature relationship. Just as participants could modulate the extent to which they saw themselves as part of nature in the Likert scale slightly/mostly/completely part of nature answer, extension of self to nature comes in varying degrees. Yet, a vast majority of Australian and American participants defined themselves as completely part of nature, or what Kunchambo et al. (2017) call the assimilated self. Nature and self being fully integrated. A variety of concepts and measures have been developed in order to assess the human-nature relationship, including commitment to nature (Davis, Green and Reed, 2009), connectedness to nature (Mayer, Frantz, Bruehlman-Senecal and Dolliver, 2009), connectivity with nature (Dutcher, Finley, Luloff and Buttolph Johnson, 2007), emotional affinity toward nature (Kals, Schumacher and Montada, 1999), environmental identity (Clayton, 2003), inclusion of nature in self (Schultz, 2002), and nature relatedness (Nisbet, Zelenski and Murphy, 2008). Despite these different concepts and measures, they all appear to be assessing slightly different expressions of the same underlying construct: one's subjective connection to nature. Western culture can thus be a favourable context to an extended self, or metapersonal self-construal, as all participants to the study share environmental concern and pro-environmental behaviours.

7.4.2. *Individual agency and self-efficacy*

Bandura (1997, 2006) argues that people act as agents who intentionally regulate their behaviour and life circumstances. Humans “act on the environment; they create, uphold, transform, and even destroy their environment” in a “socially-embedded interplay between personal agency, and environmental influences” (Bandura as cited in Volpe, 2004). In this view, humans are self-organizing, proactive, self-regulating, and self-reflecting. Bandura (2006, p. 165) explains that “in addition to regulating their actions, people live in a psychic environment largely of their own making”. He (2006, p. 165) further adds that “given that individuals are producers as well as products of their life circumstances, they are partial authors of the past conditions that developed them, as well as the future courses their lives take”. Participants to this study, representing a minor pro-environmental trend within Western American and Australian cultures, perceive themselves as “open-minded”, “conscious”, “independent”, “disliking labels”, or “anti-capitalist”. This is the lexical field present in the participants’ answers to survey question 20 on how they define themselves (i.e., ecologists, activists, ecofeminists, etc.). This may suggest that they share an independence of self and a critical way of thinking, and it may also suggest that they are not afraid of appearing different or original in society.

In the larger scope of individual agency, questions remain as to whether and how genetics or the environment influence specific behaviours. According to Gould (2007), the major explanatory battle is not between nature and nurture, as commonly framed, but whether “nature operates as a determinist that has culture on a ‘tight leash,’ or as a potentialist that has culture on a ‘loose leash’”. Likewise, Dobzhansky (1970) says that the human species was selected for learnability and plasticity of behaviour, not for behavioural fixedness. He observes that people do not just react to changes in evolution, they are prime players in the coevolution process. The belief of personal efficacy, or self-efficacy, is central among the mechanisms of human agency. Bandura (2006, p. 170) articulates this argument as follows:

Unless people believe they can produce desired effects by their actions, they have little incentive to act, or to persevere in the face of difficulties. Whatever other factors serve as guides and motivators, they are rooted in the core belief that one has the power to effect changes by one’s actions.

Several researchers (Schutte and Bhullar, 2016; Yoong, Bojei, Osman and Hashim, 2018) have studied the relations between self-efficacy and pro-environmental attitudes and behaviours. They show that perceived self-efficacy has a positive influence on environmental attitudes and enables individuals to pursue pro-environmental behaviours. Most participants to this study believed in their ability to bring anticipated outcomes in a pro-environmental context, and their intentionality provided direction, coherence and meaning to their life. The majority of participants believe that human behaviour is somewhat, if not entirely, responsible for climate change and that individual action may help to reduce its effects (Leiserowitz, 2007).

If environmental attitudes and behaviours are inherited from society, they become strong and reliable only when environmental values are assimilated and endorsed by the individual, and ‘seem’ to come from within. This is confirmed by the present study because participants think that they have control over the direction of their lives and that they are responsible for their actions (the word “responsible” comes up a lot when the participants describe themselves). Likewise, a study by Taberner and Hernandez (2010) shows that while self-efficacy and intrinsic motivation are positively related to recycling, extrinsic motivation is negatively related to recycling. This is in accordance with Gifford’s (2011) work on the psychological barriers to environmental behaviour change. As the pro-environmental participants to this study exemplify, through a process of internalisation, culture transforms human minds and ultimately transforms itself from within, spreading from the individual to the community (Toomela, 1996).

7.5. Nature exposure as culture-shaping

It is interesting to note that nature has an influence on culture. Would people behave in a more pro-environmental way after simply being exposed to natural surroundings (including wild natural areas, such as forests, but also nearby natural environments, like urban parks, gardens, and vacant lots – Keniger, Gaston, Irvine and Fuller, 2013; Rupprecht, Byrne and Lo, 2016)? Does nature exposure eventually shape environmental culture? The simple and straightforward effects of nature exposure on the human-nature bond are best illustrated by this Australian participant’s comment during an interview: “The more you interact with nature in person the more you realise that you are just a part of nature, not separate from it. Once you have that feeling there is no forgetting again”. There is empirical evidence suggesting a positive link between direct experiences in nature, or nature exposure, and people’s environmental attitudes and behaviors (Chawla and Derr, 2012). Similarly, researchers have warned that modern lack of experiences in nature may have negative consequences for people’s pro-environmentalism (Soga and Gaston, 2016; Evans, Otto and Kaiser, 2018) which could lead to detrimental consequences for the environment (Evans, 2019). As a result, there has been a proliferation of initiatives (e.g., No Child Left Inside movement) and publications (Louv, 2005) targeted at the general public with the aim of encouraging a more frequent contact with nature from early childhood.

Just as Moore (1975) questions the extent to which culture can be defined simply as learned behaviour, several studies (Alcock, White, Pahl, Duarte-Davidson and Fleming, 2020; Geng, Xu, Ye, Zhou and Zhou, 2015; Whitburn, Linklater and Milfont, 2018) confirm one of the results of the present study,

which is that nature exposure also plays a role in shaping an individual's relations to nature. Nature exposure is a form of environmental education as this comment by an Australian participant demonstrates:

Growing up, I had opportunities to spend a fair amount of time in natural surroundings. I think one of the most important parts about this time was that I felt that I wasn't under the surveillance of parents or other authority figures. As a child, I felt that nature was somewhere I could feel free and somewhere where I belonged. Having the opportunity to enjoy nature as it was – unshaped and unruly – was also important in fostering a feeling of connection and a relationship with nature.

Through its influence on individuals, nature exposure can be seen as a force shaping culture. And, as such, human environments and natural environments alike influence our relation to nature. Alcock et al. (2020) claim that exposure to nature can be associated with greater pro-environmentalism. The present study confirms the role of childhood nature experiences in shaping adult pro-environmental views and behaviours. Greater contact with nature during childhood seems to be associated with greater contact with nature as an adult, which, in turn, is positively associated with PEBs. This finding is also in accordance with a study by Rosa, Profice and Collado (2018) in which authors argue that the stimulation of pleasant experiences while in direct contact with nature during childhood triggers pro-environmental actions in adulthood. An American participant justifies his adult pro-environmentalism this way:

I grew up in an Ecovillage in New Hampshire. Growing up, taking care of the environment was more of a given than something that happened after a particular moment or event. Today, living an environmentally friendly lifestyle is still a priority to me.

Many researchers argue that childhood positive experiences in nature are the main factor predicting pro-environmentalism later in life (Corcoran, 1999; Tanner, 1980). These studies are mainly qualitative and retrospective. For instance, Tanner (1980) evaluated the experiences that 45 environmental activists recalled as being more important for their decision of working as environmental conservationists. His findings indicate that experiences in nature as a child were the main predictor of their choice. The following words by an Australian participant show how childhood experiences in nature are important for the formation of a bond with nature that lasts until adulthood.

My father owned a large wilderness forest property in the Blue Mountains, near lake Jindabyne, where we built a house and spent a fair bit of time. And I've also had friends with horse and sheep farms across NSW that I used to run and ride about on as a child. I learnt to live with other animals early on in a more natural habitat. I've always liked to be near the ocean and swim. Also having pets as a child helps develop a respect for other creatures' needs.

As a general trend, the relation between nature exposure and PEBs is mediated by environmental attitudes. Why, and how, does spending time in nature influence environmental attitudes? Studies (see below) show that nature exposure alters human beings on the following different levels: physical, mental and emotional. From this altered, or renewed, state, human beings develop stronger pro-environmentalism, such as willingness to conserve biodiversity (Prevot, Cheval, Raymond and Cosquer, 2018; Soga and Gaston, 2016), or willingness to pay for the conservation of urban green spaces (Lo and Jim, 2010). Some of the benefits of nature exposure on human physical, mental and emotional states are as follows:

(1) On a physical level: It can lower blood pressure and stress hormone levels, reduce nervous system arousal, enhance immune system function (White et al., 2019). It can reduce the risk of type II diabetes, cardiovascular disease, premature death, and preterm birth, and it can increase sleep duration (Williams, 2017). A study by Rose et al. (2008) also shows that it reduces risks of myopia.

(2) On a mental level: It restores cognitive resources and provides a renewal of depleted attentional capabilities (Byrka, Hartig and Kaiser, 2010). It helps with mental health problems such as anxiety, depression or addiction (Martin and Dahlen, 2005; Martin, Pahl, White and May, 2019). Nature exposure also generates increased biocentric values (Larson, Whiting and Green, 2011), strengthened beliefs about the New Environmental Paradigm (Collado, Staats and Corraliza, 2013), and a stronger sense of moral obligation toward the environment (Hahn and Garrett, 2017).

(3) On an emotional level: It increases positive emotions (Mayer, Frantz, Bruehlman-Senecal and Dolliver, 2009), feelings of happiness (Capaldi, Dopko and Zelenski, 2014), connectedness to nature (Otto and Pensini, 2017), and generates a stronger sense of place attachment (Albrecht, 2019; Lawrence, 2012).

According to this American participant, nature is a positive force influencing human wellbeing:

When I get outside and away from the human environment, I suddenly feel better. I can note this in small ways, like going for a walk in my neighborhood and just looking at the trees and sky rather than the city streets/cars/etc., or when driving outside of the urban/suburban environment, I will suddenly feel more relaxed when I reach an area of open space, forest, or other natural areas.

To conclude, nature exposure can be seen as an effective tool in fostering environmental attitudes and behaviours, and nature exposure in childhood can predict adult pro-environmentalism.

7.6. Toward a global cultural ecology

7.6.1. Culture and globalisation

Nature exists both within and without human culture, and pro-environmental trends reflect today's society's attempt at reorganising itself in the face of the environmental crisis. As explained in chapter 6, nature cannot be understood outside of culture and culture is constantly influenced by natural environments. An Australian participant puts it this way:

The human/nature dualism implies these are two separate systems. This fails to account that human culture comes from living with and intersecting with the natural world. The two are interlinked and the failure to recognize this leads to many of the current environmental problems that exist today.

Contemporary Western culture is characterised by such creations as plastic, cars, smartphones, computers, etc., which are largely accepted and used, yet environmentally harmful. Talking about such artefacts has raised many torn answers from the participants – feelings of both guilt and appreciation for what these tools could bring in everyday life. However, one thing that characterised participants is that they accept human modern creations as natural, instead of artificial. Their culture is a humanature continuum. The following words by an American participant illustrate this:

There isn't any way to 'get out' of nature – plastic and electricity are ontologically continuous with anything any species crafts as part of a reciprocal interaction with one's environment – such as beaver dams or claws. Maybe more useful is to think about these things as products of our interaction with other species and the world around us. Plastic is a gift from plants and others who died millions of years ago, and it is our entanglement with others, humans and nonhuman, which make any of our human creations possible.

The concept of cultural ecology relates to human adaptations to social and physical environments, and how natural environment is a contributor to social organisation and other human institutions (Frake, 1962; Orlove, 1980). Pro-environmental individuals represent a new form of cultural ecology and question the ways in which humans can develop a more acceptable cultural relationship with the environment.

Indigenous cultures in the United States and in Australia are sometimes taken as examples of viable eco-responsible communities, which is in accordance with the notion of sacred ecology, a sub-topic of cultural ecology (Berkes, 1999). According to one of the Australian participants, "Indigenous people lived in harmony and took responsibility as stewards becoming part of the ecosystem". In the same way, an American participant explains that "I grew up on a farm in a small town, I always had access to nature. I wanted to emulate (somehow 'be') a Native American". Sacred ecology aims at preserving traditional cultures, indigenous rights, sacred sites and practicing regenerative organic agriculture for the biodiversity preservation and to shape a new environmental perception for urban residents. This particular

conceptualisation of people and environment comes from various cultural levels of local knowledge about species and place, resource management systems using local experience, and social institutions with their rules and codes of behaviour. As a mismatch of several trends, contemporary Western culture can be seen as a balancing act between a mindset devoted to the exploitation of natural resources and that, which conserves them. However, if some participants mentioned Aboriginal and Native American cultures, it was always in an idealised, romanticised fashion that was disconnected from the specific realities of these cultures.

A global cultural ecology is also shared and made possible through the use of digital technology. The pro-environmental actions of the participants – as a form of subactivism, and environmental advocacy and activism – are fuelled by the Internet, which helps the transmission of ideas and values around the world in such a way as to extend and intensify social relations. The advent of digital technology has made cultural globalisation possible. Cultural globalisation is defined as the common consumption of cultures that have been diffused by the Internet, popular culture media and international travel (James and Tulloch, 2010; Tomlinson, 1999). In the shaping of a pro-environmental culture, and a global cultural ecology, this circulation of cultures has enabled participants to this study to partake in extended social relations crossing national borders and to share a commitment to certain attitudes and actions toward the environment. As James and Steger (2010) observe, the creation and expansion of such social relations is not merely observed on a material level, but also involves the formation of shared norms and knowledge with which people associate their individual and collective cultural identities. The cultural similarities between American and Australian participants were reinforced by access to online pro-environmental communities. The globalisation of pro-environmental values and ideas is supported by the Internet and social media in particular. It both brings increasing interconnectedness among different individuals and cultures, and strengthens a global, unified form of communication on nature conservation. As an example, Instagram is a key social media support for the Zero Waste movement, and it displays similar-looking pictures, from zerowasters around the globe, of downshifting, plastic-free lifestyles.

7.6.2. The spiritual dimension of the human-nature bond

Nature exposure is viewed as an activity with holistic benefits on human wellbeing and health. Its powerful effects on all dimensions of being human has given rise to discussions on the spiritual dimension of the human-nature relationship, and to such concepts as spiritual ecology, ecospirituality, deep ecology or the Gaia hypothesis (Lovelock, 1995, 2000; Sponsel, 2014). Ecospirituality – which I will use as the main expression to refer to these related concepts – is defined as the manifestation of the spiritual connection between human beings and the environment. According to Lincoln (2000, p. 227), it incorporates “an

intuitive and embodied awareness of all life and engages a relational view of person to planet, inner to outer land-scape, and soul to soil". A majority of participants to this study asserted a need for contemporary conservation work to include awareness and spiritual engagement in ecological issues. As this American participant observes, "Nature entails life. Perhaps nature is consciousness, as in, consciousness or presence precedes matter". Many participants' words echoed Suzuki's (2014, p. 11) when acknowledging the importance of including the sacred in addressing the ecological crisis:

The way we see the world shapes the way we treat it. If a mountain is a deity, not a pile of ore; if a river is one of the veins of the land, not potential irrigation water; if a forest is a sacred grove, not timber; if other species are biological kin, not resources; or if the planet is our mother, not an opportunity – then we will treat each other with greater respect. Thus, is the challenge, to look at the world from a different perspective.

Ecospirituality includes a deep, developing vision of a collective human/nature/divine evolution that is expanding consciousness beyond the dualities of human/nature, mind/body, heaven/earth, etc. (Bloch, 1998). This mindset seems to be common to most participants who recognised the unity and the interconnectedness of all of creation. Developing on Albrecht's (2019) concept of Symbiocene (see chapter 6, point 6.3.3), the term *eutierra* (the prefix *eu* comes from the Greek word for good, the root *tierra* means Earth) refers to a positive feeling of oneness with the Earth and its life forces. Participants describe similar experiences when their perception of the boundaries between themselves and all else seem to evaporate, and they become one with the universe.

Care for and respect to Earth as a sacred entity that provides life and nourishment is a central point to earth-based spirituality. Taylor (2001) argues that although participants in countercultural movements often eschew the label religion, these are religious movements, in which individuals find ultimate meaning and transformative power in nature. Focusing on the deep ecology movement, he further contends that a sense of connection and belonging to nature (sometimes personified as a transforming, if not transcendent power) unites these different forms of ecospiritualities. Many answers to the survey put forth the narration of an evolving universe and potential human experience of wholeness in which dualities dissipate ("I am of the belief that we are all connected", US - "the planet is an ecosystem, we are all in this together, no matter where we live", US). This view of nature and human as a whole (humanature) is widely confirmed by the study's findings.

Another common thread within the participants' answers was a form of contemporary spirituality which is distinct from more traditional religions. Contemporary spirituality has been associated with a decline of tradition (Heelas and Woodhead, 2005), and is informed by processes of secularisation and globalisation (Campbell, 2007). Many researchers (Giner and Tabara, 1999; Taylor, 2010; Tucker and Grim,

1994) argue that contemporary spirituality converges with, and can potentially form a common ground between, multiple religions – notably in the ways it asserts a larger, transcendental meaning to life, and recognises a sacred dimension to existence. Most participants to this study, both within and outside of traditional religious structures, experienced a profound sense of something spiritual and holy existing in the natural world. The outdoors and the wilderness felt sacred for many, whether they define this sacredness as a connection to a transcendent, divine, creative force (“Life”, “God”), or to the reality of ecological interdependence (“ecosystem”).

7.7. Culture, wonder and awe

Western culture, from an environmental perspective, was mostly criticised by participants. While an Australian participant advocates “a complete change from the cultural system, away from the masculine, extractive, growth economy of the modern Western ideal”, another Australian participant feels “separate from nature because of my guilt for living what I deem an ‘unnatural’ life – reliant on technology that dominates and destroys nature”. But culture can also be a source of awe and wonder experiences, notably via art as a subset of culture. The awe effect that nature elicits (see chapter 6, point 6.4) can also be induced by cultural artefacts. If culture holds human’s worst creations, it also holds its most beautiful inventions. In the present study, many participants share the view that digital technology, when used judiciously, is “amazing”, “a wonderful tool”, or “positive yet distracting”.

Culture, and more precisely art, when offering experiences of awe and wonder, relates to the divine in the human, that part of magic and mystery that can deepen human-to-human bonds (Chirico, Gaggioli, Clewis and Yaden, 2021; Oelschlaeger, 1991). Awe experiences are self-transcendent, they shift our attention away from ourselves, make us feel like we are part of something greater than ourselves, and make us more generous toward others. Keltner and Haidt (2003) suggest that awe experiences can be characterised by two phenomena: perceived vastness and a need for accommodation. ‘Perceived vastness’ can come from observing something literally physically large (e.g., the Grand Canyon) or from a more theoretical perceptual sense of vastness. And a ‘need for accommodation’ is related to experiences which violate our normal understanding of the world. “When a stimulus exceeds our expectations in some way, it can provoke an attempt to change the mental structures that we use to understand the world”, Allen (2018, p. 3) points out. This need for cognitive realignment is an essential part of the awe experience as conceptualised by Keltner and Haidt (2003).

The experience of awe induced by a natural environment is the ultimate human-nature bonding experience as it impacts the individual as a whole – mentally, emotionally and physically. Awe experiences bring a host of physiological, psychological, and social effects. For example, studies have found that feelings of awe can be accompanied by heart rate changes, goosebumps, and the sensation of chills, and there is some evidence that awe may even decrease markers of chronic inflammation (Benedek and Kaernbach, 2011; Silvia, Jackson and Sopko, 2014; Stellar et al., 2015). When it comes to psychological effects, studies found that awe can increase feelings of connectedness, increase critical thinking and positive mood, and that it can decrease materialism (Chirico et al., 2021; Zhao, Zhang, Xu, He and Lu, 2019). For many people, experiences of awe are deeply intertwined with spirituality, and awe is an inherent component of many religious traditions, stories, and rituals. According to Schneider (2018), a sense of awe is “foundational to the major religions and may even be at the vanguard of a new spiritual consciousness” – what he calls ‘awe-based consciousness’ or ‘enchanted agnosticism’, and Schaus (2018) terms ‘post-secular humanism’. Schneider (2018) suggests that this awe-based consciousness is highly compatible with the spiritual seekers amongst the growing number of “Nones” – people who do not identify with a particular religious group as was the case for the majority of the participants.

The awe effect derived from art has the added value of the human-to-human connection, and may serve as a way to reconcile with Western culture, shifting from an individualistic culture to a more collectivistic culture. Allen (2018) advances that awe experiences derived from cultural sources include feeling in awe of another person. She lists different sources of interpersonal awe such as moral beauty, virtuosity, extreme altruism or charismatic dominance. The aforementioned studies on the science of awe show that if Western civilisation aims for a functioning environmental culture (i.e. becoming an ecological civilisation being the final goal of social and environmental reform – Zhihe, Huill and Meijun, 2014), reconciling human and natural systems is essential. On the other hand, idealising nature at the expense of humankind is lopsided and breaks the humanature continuum. As Oelschlaeger (1991, p. 349) observes:

But is a world devoid of Bach and Wordsworth, the Bible and the Tao Te Ching, Plato and Shakespeare, Einstein and Schrödinger, a world with only the singing sounds of running water, the wind, the birds, a better world? Would the good earth be better off without poetry, music, art, religion, science, philosophy, and all those other achievements of the human spirit that seem to distinguish us from the rest of Creation? And what would be the consequences for wild nature if the human species failed? Can a cosmos devoid of consciousness to contemplate itself be a cosmos?

Many pro-environmental individuals today tend to see humans as inherently bad. As an American participant argues, “I think humans have denatured their home with their creations. We have broken

harmonious cycles and thwarted natural rhythms". Thus, the question is: can human and culture be worth considering for the best they brought, and not only for the worst?

7.8. American and Australian similarities and differences and conclusion

Although feeling bound by cultural traditions and worldviews that perpetuate environmental degradation, participants intentionally nurture an environmental worldview and both countries illustrate a shift from the Dominant Social Paradigm to the New Environmental Paradigm. The overall trend is that culture works as a form of collective belief and collectively assumed reality. Both the American and the Australian pro-environmental cultures redefine the perception of the self in relation to others and to nature. The concept of extended self (i.e. nature and others as an extension of the individual self) makes American and Australian culture collectivistic rather than individualistic. Pro-environmental individuals rely on nature for physical, emotional and mental wellbeing, and nature exposure strengthens the human-nature connection and, in turn, generates pro-environmental attitudes and behaviours. With the help of the Internet and digital technology, pro-environmental individuals are shaping a global environmental culture, sharing and interacting with other like-minded persons across the globe via digital environmental advocacy and activism. In both countries, the human-nature connection bears an important spiritual dimension, and this ecospirituality is beyond religions and dogmas. Some participants are inspired by Indigenous cultures (i.e. Native American and Aboriginal) and assert that they are more sustainable and respectful for the environment than Western culture. The main and only difference between American and Australian participants was in the conceptualisation of human modern creations. As a form of cultural artefact, contemporary items such as smartphones, cars, computers, plastic, etc. were overly criticised by American participants as being environmentally destructive and responsible for the climate crisis. In Australia, participants were more accepting of human modern creations, more often emphasising their positive dimension, especially for digital technology.

With the advent of the ecological crisis, Western American and Australian cultures have increasingly focused on the human-nature relationship in an attempt to deconstruct old conceptions, and on a need to redefine this relationship based on the interconnection between all living things. This shift gave rise to a paradigm shift and to a pro-environmental culture, which was also made possible and stronger by digital technology and global connectivity. In this respect, the digital revolution (digital technology being a symbol of contemporary Western culture), by accelerating the exchange of information on a global scale, has generated a pro-environmental culture within the dominant Western culture. It can be seen as a

transformational phase in Western culture in which nature is being respected and glorified, and the human-nature bond being asserted. Likewise, this can be seen as a transformational phase in human identity as pro-environmental individuals tend to redefine their self-concept as extending beyond their own body to the rest of the world (thus questioning the human/nature and individual/universal Western dualisms). The main difference between American and Australian participants being in their acceptance of human modern creations, this can be explained by the fact that Australian participants spend less time online than American participants and are less dependent on digital technology. Their close surroundings are greener (American participants emphasise more urbanity than naturality in their surroundings) as Australia is less urbanised and populated than America. Less online time and more green time may be correlated to a more positive relation to digital technology for Australian participants.

Humans cannot survive without culture. Everything they see, touch, interact with and think about is cultural, and this includes nature. As such, culture is a major adaptive mechanism for humans. Culture becomes such an integral part of human existence that it *is* the human environment. This is why it is impossible to separate nature and culture, and this renders the human/nature dualism obsolete. Moreover, given that culture is seen as the primary adaptive mechanism of humans and takes place much faster than human biological evolution, most cultural change can be viewed as culture adapting to itself. In the present study, Western culture adapting to itself in a time of ecological crisis has generated the rise of an environmental culture. This environmental culture, shared by both groups of participants, is the by-product of human interactions with nature and nature transformation of human physical, psychological and emotional states.

8. Discussion Part Three: Digital technology

Humans never were part of nature. We were always part of technology.
(Potter, 2014, p. 132)

8.1. Introduction

The first two parts of the discussion on nature (chapter 6) and culture (chapter 7) aimed at defining these broad concepts in the context of contemporary environmentalism and the human-nature relation. These parts related to the fields of critical thinking, ecopsychology and ecophilosophy. Digital technology is a part of culture but is treated as a separate chapter informed by empirical evidence from the research related to how participants engaged with both nature and culture via digitalism (i.e. the condition of living in a digital culture – Negroponte, 1995). Digital technology is a key notion in this study and it has a specific impact on the humanature continuum. As I explained in the literature review (chapter 2, point 2.2.2), the expression humanature which is used by several scholars (Dickinson, 2013; Haraway, 2008; Milstein, 2011) is a linguistic attempt to illustrate the interconnection between human and nature, and it shows how the Western mind is now ready to accept this interconnection. This chapter both aims to explain what digital technology as a cultural tool is and its impact on Western society and pro-environmental individuals, its role in the current ecological debate and in nurturing or preventing the human-nature bond. It also aims to define digital technology in the light of the humanature bond, and to unite the first two parts on nature and culture and explain how these three notions, nature, culture and digital technology, form a whole in the humanature continuum. I will start by explaining the characteristics of the digital society, which include connected individualism, transparisation and cognification. I will detail how digitalism has impacted the human-nature relationship, and redefined human sense of space and time. And I will describe how nature exposure can benefit digital habits and human health.

8.2. Culture and society in the digital age

8.2.1. Toward a digital society

The new information technologies and their global diffusion have radically influenced the changes in Western society. The current process of globalisation has been strengthened by the Internet which has evolved with unprecedented rapidity. Levin and Mamlok (2021) argue that the digital revolution's essence is fully manifested in the cultural changes that take place in society. These cultural changes include blurring the distinction between reality and virtuality, and among people, nature and artifacts, and the reversal from information scarcity to abundance. They name the following phenomena as being the prominent trends characterising Western digital culture: individualisation, transpatisation (i.e. the general tendency to share everything online) and cognification (i.e. intellectualisation of the surrounding environment). In the process of characterising contemporary society, the present study highlights two salient features of the pro-environmental trend: individuals and their identity, and networks. Participants to the study all shared these characteristics, on the one hand, promoting individual environmental action and, on the other hand, relying on digital and real-life networks to spread their views. These two characteristics are often found together in the notion of connected individualism – also called relational individualism or networked individualism (Christman, 2004; Flichy, 2004; Radden, 1996). Radden (1996) argues that people's identities, needs, interests – and indeed individualism – are always also shaped by their relations to others. Christman (2004) also observes that human identity is built on the embeddedness of everyone's self-conceptions, on the relational nature of people's motivations and on the overall social character of human beings. Individuality and community are in constant interaction in this dynamic. The present study confirms this dynamic between the individual and the collective and indicates that it represents a bridge in the Western individual/global dichotomy. It is interesting to note that this bridge was made possible by digital technology and the global connectivity offered by the Internet. Environmental identity can foster individual pro-environmental actions, but Schulte, Bamberg, Rees and Rollin (2020) argue that it is a stronger predictor of collective pro-environmental action than of individual pro-environmental private-sphere behaviour. This shows the connection between nature, individual and society. Participants to this study confirm that their individual environmental identities ultimately serve wider, collective pro-environmental behaviours.

8.2.2. Connected individualism in contemporary society

Connected individualism represents the shift of the classical model of social arrangements to connected individuals using the means provided by the evolution of information and communication technology (Castells, 2003; Wellman, 2001). Individualism and community are not exclusive concepts. In the context of this study, participants exemplify the connection between the two and how individual environmental

activism (Schulte, Bamberg, Rees and Rollin, 2020) both serves the individual and society. Eden (1993) talks about individual environmental responsibility – which he defines as including such actions as green consumerism, passive membership of environmental groups, or domestic recycling – and he asserts that it plays an important role in public environmentalism, thus enhancing the constant exchange between individuals and the group. Likewise, the concept of environmental citizenship – also called green governmentality by Darier (1996) – posits that “environmental conservation is everybody’s sole responsibility at all time, based on one’s life choices in minimizing ecological impact on earth” (Meerah, Halim and Nadeson, 2010, p. 5715). According to Gotman’s (1988) concept of positive individualism, the contemporary family offers everyone the possibility of building their personal identity. People no longer simply reproduce what they acquired from the previous generation, they can create something new. Individuals can reappropriate their own heritage, claiming to take after a particular ancestor rather than another, feeling part of a lineage or refusing it, or even following a tradition that is not their own. In accordance with Singly’s (2003) theory on disaffiliation, participants to this study intentionally disengaged from their initial affiliations with what an American participant calls “the capitalist side of Western culture” and choose new affiliations, in this case with pro-environmental groups – which are the result of an individual choice. Beck and Beck-Gernsheim (2001) acknowledge two transformative processes in contemporary Western civilisation: globalisation and individualisation. Even if studies (Cote and Schwartz, 2002; Mayer, Alvarez, Gronewold and Schultz, 2020) have reported how the digital age promotes new forms of individualism with self-tracking technologies and self-presentation in social networks, Beck and Beck-Gernsheim (2001) demonstrate that individualisation is a structural characteristic of highly differentiated societies. It does not imperil social cohesion but actually makes it possible. Social relationships are changing, and technology is a driving force in many of these changes. There are some fears that digital technology is killing society, but studies by the Pew Research Center (2009) and by Baecker, Sellen, Crosskey, Boscart and Neves (2014) show that these technologies are not isolated – or isolating – systems. They are genuinely incorporated into people’s social lives. The majority of participants acknowledged the importance and usefulness of digital technology in fostering pro-environmental attitudes and behaviours, and in nurturing their connection both to nature and to other like-minded people. The following words from an American participant illustrates this:

I use technology in a positive way to promote my farm and to recruit interns for my farm. It’s enabling the growth of our organic, sustainable permaculture farming operation, thereby deepening our connection and interaction with nature. Technology is a powerful tool, it is not inherently bad or distancing us from nature. But it must be used judiciously.

Arts, Van der Wal and Adams (2015) explain how digital technology is changing nature conservation in profound ways. They describe this impact and its significance through the concept of *digital conservation*.

They agree along with Lanzara (2009, p. 38) that technology can be understood as a force that shows an “ambivalent face, empowering and hindering at the same time”. Like many participants, this Australian participant agrees on this ambivalence and finds that digital technology can both help them to connect to nature and prevent them from doing so:

Both! It helps me connect with likeminded people and get involved in local events and online communities. It helps me learn, think and socialise in many ways. On the other hand, perhaps I spend less physical time in nature as a result.

8.2.3. Transparisation

The information revolution is not limited to a more advanced technological solution for attaining knowledge or completing various daily tasks. Levin and Mamlok (2021, p. 3) argue that the emergence of the Internet has influenced how people understand their own identity: “it signals a shift in the ways in which we, as individuals and societies, understand the very basic idea of what it is meant ‘to be’”. Through the notion of *Web presence*, they (2012, p. 3) explain that “the embodiment of digital technology is indispensable not only from how one conducts his everyday life but also from how one’s ontological existence is constituted”. In its first years, the Internet served as a communication technology platform. It was conceived only as hypertext, and just being more advanced and more convenient to use than a book. But the Web 2.0 had users move from a one-way relationship (the user can seek or attain information) to a two-ways-relationship (the user can access various types of content *and* produce content). This has transformed user experience from being passive to active (Fleischer, 2011). The participants to this study exemplify those changes and the way they reshaped how people interact among themselves and with nature. Indeed, 73% of American participants and 66% of Australian participants use the Internet to share their experience about green lifestyle via social media, blog, website, etc. Their Web presence is a key element of their online green activism, so is the transparency they offer on their activity and in their interactions with others online. Levin and Mamlok (2021) call the general tendency to constantly share everything *transparisation*. They think that the transparisation of the social culture is supposed to counterbalance the individualism inherent to the digital space. The study of the joint dynamic of individualisation and transparisation is closely related to the notion of relational self developed by Herring (2019). It refers to aspects of the self associated with one’s relationships with others. Buber (2012) observes that the self manifests itself only in a relationship with another. This is confirmed by the widespread use of social media of the participants, which facilitate connections among pro-environmental people by unprecedented opportunity to create an almost infinite variety of social relationships. The use of social media is stronger in the American results. Results from the online survey on social media consumption show that 89% of American participants check social media

daily, so while 11% of American participants are not on social media, double this rate (22%) of Australian participants do not use social media. These results are aligned with the fact that Australians are less connected than Americans. From the interviews, this form of disconnection was not viewed as an attempt to be “anti-social”. Australian and American participants who were not on social media did so to take charge of when and where they connected with people, and to be more social rather than anti-social.

8.2.4. Cognification (intellectualisation of the surrounding environment)

Cognification, or the intellectualisation of the surrounding environment with smart technologies, has radically changed the human-to-human and human-to-nature experiences, and it has reshaped one’s worldview. Kelly (2016, p. 46) characterises the phenomenon of cognification as follows:

The artificial intelligence (AI) on the horizon looks more like Amazon Web Services – cheap, reliable, industrial – grade digital smartness running behind everything, and almost invisible except when it blinks off. This common utility will serve you as much IQ as you want but no more than you need. You’ll simply plug into the grid and get AI as if it was electricity. It will enliven inert objects, much as electricity did more than a century past.... Now everything that we formerly electrified we will cognify. There is almost nothing we can think of that cannot be made new, different, or more valuable by infusing it with some extra IQ.

Participants exemplify how digital technology is blurring the distinctions among people, nature and artifacts. For most of human history, distinguishing artifacts (i.e. an object of cultural or historical interest made by a human being) from nature was a relatively uncomplicated task. Today, based on the significant advances in medicine and biotechnology, humans and artifacts are becoming increasingly linked (Floridi, 2015). Levin and Mamlok (2021) confirm that the extensive integration of smart sensors in human life and the integration of the emerging technologies of the internet of things (IoT) are blurring the distinction between humans and artifacts. For many participants, exploring nature (the experience of nature exposure) is linked to using smart technology (GPS, GoPro camera, smartphone, etc.) and remaining connected while in nature (“I utilize several apps that significantly improve my relationship with nature. Specifically, one app acts as a trail guide equipped with GPS so I can explore more safely, and another app helps with plant identification” - US). Whether in nature or at home, technology is part of the environment. According to Kelly (2016), the emerging integration of artificial intelligence into almost every domain of the life sphere is considered as a total cognification of humans’ environment. Levin and Mamlok (2021) think that this contradicts the traditional concept of nature, but research done by Crist (2013) and Hayles (1995) show that the distinctions between the natural world and the artificial world are changing, and so is the definition of nature. The digital transformation accelerates the blurring of the traditional human/nature divide. Arts, Van

der Wal and Adams (2015) argue that connected digital tools are allowing people to have greater mastery and understanding of sustainability implications. In the context of digital conservation, they found the following pivotal dimensions: data on nature, data on people, and communication and experience. These dimensions were also present in this study's findings.

(1) Data on nature

Participants' access to digital technology make it possible for them to access more, better, faster and cheaper capture of data on nature (Koh and Wich 2012; Van Tamelen, 2004). From multi-sensor equipped smartphones carried by humans and satellite tags carried by animals, to camera traps, drones, deep-sea submarines and space satellites. These technologies provide unique experience of nature online and enable participants to see things they would not normally see on a local basis. As this Australian participant observes:

The availability of information through digital sources is a great resource for investigating and experiencing nature in a variety of modes. There is the purely informational (research, GIS, statistics, etc.), the entertainment (nature and wildlife programmes), and the practical – I might learn how to take macro photographs of insects from exploring online photography forums for example. Digital conservation, via access to online data on nature, also develops connectivity among pro-environmental individuals on a global scale. It encompasses the prominent trends of digital culture (i.e. individualisation, transpatisation, and cognification). Individuals around the globe can access nature data and learn about conservation issues (individualisation). In doing so, they build a pro-environmental online image of the self and of their Web presence (transpatisation). And, they rely on smart technologies to access unique human-to-human and human-to-nature experiences (cognification).

(2) Data on people

With the increased flow of data and information, a new level of monitoring has become possible, notably through the mining of social networks and through 'web crawlers', software scripts that methodologically browse the World Wide Web (Barve, 2014; Galaz et al., 2009). In the scope of this study, which is a netnography, informations on potential pro-environmental participants were gathered online from social media, websites, blogs, YouTube, etc. Additionally, search engine data was used to analyse signs of changes in environmental perceptions of Internet-using communities (Ficetola, 2013; Proulx, Massicotte and Pepino, 2013).

(3) Communication and experience

The Internet has offered lay people and experts new means to self-organise and exchange ideas, experience and footage (Ashlin and Ladle, 2006). During the interviews, participants explained how they valued platforms like iNaturalist, the Atlas of Living Australia, etc., which do not only provide scientists with data,

but also allow people to become part of a community through uploading observations of flora and fauna, inspecting sightings by others, and fostering discussion on and learning about the natural world.

8.3. Digital technology and the human-nature relationship

8.3.1. The Fourth Industrial Revolution and the human-nature connection

An important question is not ‘is digital technology changing our relation to nature?’ but ‘how is digital technology changing our relation to nature?’ Digital technologies that have computer hardware, software and networks at their core are not new, but they are becoming more sophisticated and integrated and are, as a result, transforming societies and the global economy. Brynjolfsson and McAfee (2014) state that the world is at an inflection point where the effect of these digital technologies will manifest with full force through automation and the making of unprecedented things. In a similar way, characterised by new technologies fusing the physical, digital and biological worlds, the fourth industrial revolution (or Industry 4.0) is the ongoing automation of traditional manufacturing and industrial practices, using modern smart technology. Large-scale machine-to-machine communication (M2M) and the internet of things (IoT) are integrated for increased automation, improved communication and self-monitoring, and production of smart machines that can analyse and diagnose issues without the need for human intervention (Schwab, 2017). Mobile and computing have been applied across many fields to reconnect people to the natural environment. Well-designed examples are inherently engaging and promote embodied, context-specific experiences providing richer experiences for individuals, such as geocaching (Fornasini, Dianti, Bacchiega, Forti and Conforti, 2020).

Modern technology conceived to support conservation and sustainability is often adopted and praised by participants to the present study. For instance, some projects include *FetchClimate*, a free, cloud-based service that allows experts to access accurate climate change data from any geographical region around the world. Other softwares aim to boost human appreciation of nature, from *Leafsnap*, which applies facial recognition technology to leaves in order to help users identify tree species, to mindfulness apps that can help people to reconnect with the environment. According to Joppa (as cited in Flatt, 2015), “Technology has impacted most positively on nature in the past ten years through our emerging ability to achieve near constant monitoring of valuable natural assets, such as protected areas and rhinos. We are creating a powerful nexus of information”. Likewise, with the concept of green city, Galle, Nitoslawski and Pilla (2019) state that bringing nature online is the next frontier in ecosystem management and will change human relationship with the natural world in the urban age. An Internet of nature is proposed to bridge the gap between greener and smarter cities and to explore the future of urban ecosystem management. The

creation of an Internet of Nature, along with the ecosystem intelligence it provides, is an opportunity to understand urban ecosystem dynamics, promote self-sufficiency and resilience in ecosystem management and enhance connections between urban social and ecological systems. The nature/city dichotomy was predominant in the participants' answers. Yet, a few answers went beyond the dualism as this Australian participant observes:

I don't believe we are separate and distinct, especially in relation to cities and nature. Cities and nature are inherently intertwined as one is built from the other, however I do believe we do not take enough steps to preserve nature in cities.

8.3.2. Sense of place, belonging and cyberspace

An important observation is that new technologies, if they modify relationships and types of communication, also modify the notions of space and time. I will develop the notion of space in this point and the notion of time in point 8.4.2. The Internet has come to constitute a metaphorical space. It is described by Kellerman (2014) as an action space or an arena, in which users can perform activities that they traditionally carry out in physical space. The cyberspace exists jointly with physical space, with Internet users being co-present in this hybrid space. According to Warf (2021, p. 30), "the Internet has turned into a space-like entity that permits the users to perform physical-space-like human actions within and through it". Kellerman (2019) talks about dual-space society in which people function within a hybridised space that mediates between physical space and digital media, as is the case for the pro-environmental individuals who took part in the study.

Participants, as digital technology users, evolve in hybrid spaces. They are part of virtual communities, enacted in what is conceptualised as cyberspace, and they migrate to physical spaces because of the use of mobile technologies as interfaces. Mobile interfaces such as cell phones allow them to be constantly connected to the Internet while walking through physical spaces, both natural and urban. For many participants who live in semi-rural areas, digital technology is a great way to stay connected to the rest of the world and live remotely. The use of mobile technologies blurs the traditional borders between physical and digital spaces. And the shift from static to mobile interfaces brings online social networks into physical spaces (Souza e Silva, 2006). Eventually, natural spaces are reconfigured when they become hybrid spaces.

Answers to the survey and the interviews show that participants are engaged in spaces that combine the online (digital) and offline (real life) spaces and that permit their presence at a transnational scale,

through a collectively imagined pro-environmental identity. A notion of belonging results from these specific situations and contexts and extends the concept of home to a global scale. As this American participant explained during an interview the human nature tie can flourish thanks to online activities, yet a balance between online and offline time is necessary:

My recent more radical sense of deep connection has been made possible through the Internet – especially being able to find and read and hear people like Tim Morton, Val Plumwood, Zoe Todd, Kim TallBear, Eileen Crist, and others. These connections, I feel, have given me more access to connection with the landscapes and other species around me. I also tend to break up my screen time while working in the studio with more active physical activities.

Digital technology, when it is appraised by participants, is described as a useful tool to educate oneself on nature-related subjects, to connect to other pro-environmental persons and to share. This is the case for the following Australian participant who uses social media in an intentional and inspirational way:

I heavily curate my Instagram feed to show me images of natural beauty, art, nature, animals, etc... which educate and enliven me. It also inspires me to get out and experience it for myself more, and I do. I then find delight in capturing my experience of nature and sharing it with others on social media, to hopefully inspire them (and so the cycle continues). It is also my job! I use technology and social media platforms to inform, empower and inspire users to live sustainably.

The common trend between participants is that the Internet is perceived as a positive tool because it provides them with a sense of belonging. This sense of belonging is related to the concept of connected individualism detailed in point 8.2.2. If being online can appear to be a lonely activity as only one individual connects through one digital device at a time, the digital space, once accessed, is crowded with other individuals and is shaped by their relations to each other. The digital space is both individual and communal, which nurtures a sense of belonging through shared interests and online communities. This sense of belonging can be experienced literally for participants living remotely and having a need to connect to the outside world, as this Australian participant observes:

Digital technology makes my life more comfortable and less isolated living remotely as I do. Also, I limit its use to minimise my footprint on the planet. I try to live by the credo 'Live simply, so others may simply live.'

Or it can be experienced more as a universal need to be accepted and give and receive attention to and from others. The current ecological crisis has been a driving force for uniting people across the globe with the goal of protecting the planet. In times of important crisis (such as wars, environmental crisis, etc.), people's self-worth, drive and hope tend to augment when they rally to fight (Ojala, 2012; Reich, 1970; Schreiner and Sjoberg, 2005). A sense of belonging to a greater cause and to a global pro-environmental community is what digital technology offers to pro-environmental participants. Chawla (1992) argues that building place attachments contributes to the establishment of identity, sense of belonging and overall well-being of individuals. Likewise, Kellert (2002) explain that children develop positive or negative associations with the physical places they interact with from a very young age, favouring places where they undertake repetitive, social, and child-directed activities. In the digital era, these physical places are now hybrid spaces merging physical and virtual spaces. As a result, the cyberspace is now to be considered as part of the place attachments contributing to the establishment of identity and a sense of belonging. The sense of belonging when applied to natural environments is still essential (Albrecht, 2019). Chawla (1992) and Druin (2002) observe that attachments for natural places provide an unpredictable and ever-changing play-scape of sights, sounds, smells and tactile experiences that satisfy physiological, creative, cognitive and social explorations. The sense of belonging experienced with natural places is then intertwined with the sense of belonging experienced online, one promoting the other and vice versa. The connection between both worlds (virtual and physical/natural) seems to symbolise a shift of Western society from a human/nature dualism to a humanature continuum.

The sense of place can also be challenged and negatively impacted by constant connectivity and digital technology usage. During the interviews, participants compared their experience of solastalgia with digital solastalgia (i.e. the distress felt when hearing about global ecological issues online – via social media, digital news, Youtube, etc.) (see chapter 5, point 5.3.5). Solastalgia is a concept related to the self-identity. In this respect, the notion of extended self (see chapter 7, point 7.4.1) is mirrored by the redefinition of space as a hybrid place prompted by digital technology (“I feel part of the whole of Earth's community of life and whether something is happening near me or far from me, if I know of it I experience grief” - AUS). The boundaries between individual and universal are being questioned, so are the boundaries between local and global. The following words by an American participant are interesting in this prospect:

I experience digital solastalgia all the time – I have to limit my time on Twitter because of it. The digital is ore of grim all-encompassing doom feeling, while the local solastalgia is more of a powerless franticness – like I can't stop all the lawnmowers and building construction, but it drives me out of my brain to have to see and hear it.

As part of the ensemble of Western cultural dualisms depicted by Plumwood (2002a) – such as human/nature, male/female, intellect/emotion, individual/universal, etc. – digital technology may be a way to help contemporary society to moderate these oppositions.

8.3.3. Digital technology and environmental sustainability

The overall trend among participants is that digital technology, however positive and useful, is still a “guilty pleasure”. Offering access to the Internet, digital technology contributes to the global environmental debate and finding solutions to the ecological crisis. Yet, the devices themselves (smartphone, tablet, laptop, etc.) and the maintenance of the Internet draw heavily on natural resources to be created (carbon footprint, exploitative labour practices, etc.), they pollute when they are discarded, and they represent an unsustainable solution. Many participants evoke the dilemma between wanting to live an eco-conscious lifestyle and relying on a destructive and polluting technology. In this love/hate relationship, most participants seem to find a common ground using digital technology sparingly and intentionally (see digital minimalism, chapter 5, point 5.3.5). As an Australian participant explains, the main problem of this technology is the mix between the artificiality of its components and the sophistication of its engineering, which makes it “so more human than natural”:

Human technology transforms natural materials into forms that are not naturally occurring – and for me it is interesting that I do not find things like glass, brick, or wooden furniture cause me distress – and I think that is because they are effectively natural substances that occur without human intervention even if they might be moulded into new forms by humans. The action of building and shaping is not unique to humans, but the action of transforming materials into things that are not possible through biological or geological processes is unique and puts humans aside from nature in this regard.

Participants criticise the overproduction, planned obsolescence and absence of waste management of digital items. As an Australian participant argues, “there is a disconnect in the design process, where we fail to consider, plan, and prevent environmentally the life cycle of these products”.

Increasingly, researchers (Alorse, 2019; Obringer et al., 2021) denounce the environmental impact of the online world. For every single search query, every streamed song or video, and every email sent, there

is an environmental cost. Using the Internet increases global demand for electricity and rises CO₂ emissions and eventually results in toxic electronic waste. Even if we cannot physically see or touch the data that we are sending and receiving all over the globe, the greenhouse gas emissions caused by the production, operation and disposal of digital devices represent a global digital carbon footprint. According to The Shift Project (2018) study, global CO₂ emissions increased from 2.5 to 3.7% between 2013 and 2018, meaning that using digital technology causes more CO₂ emissions and has a bigger impact on global warming than the entire aviation industry. Globally, the Internet use has a carbon footprint ranging from 28 to 63 g CO₂ equivalent per gigabyte (GB), while its water and land footprints range from 0.1 to 35 L/GB and 0.7 to 20 cm²/GB, respectively (Obringer et al., 2021). And there have been significant and rapid improvements to the footprints due to technological advances. This poses an important question: will digitalisation be able to help on the way to a greener world, or will growing reliance on digital tools ultimately prove to be an accelerator for climate change and the destruction of the planet?

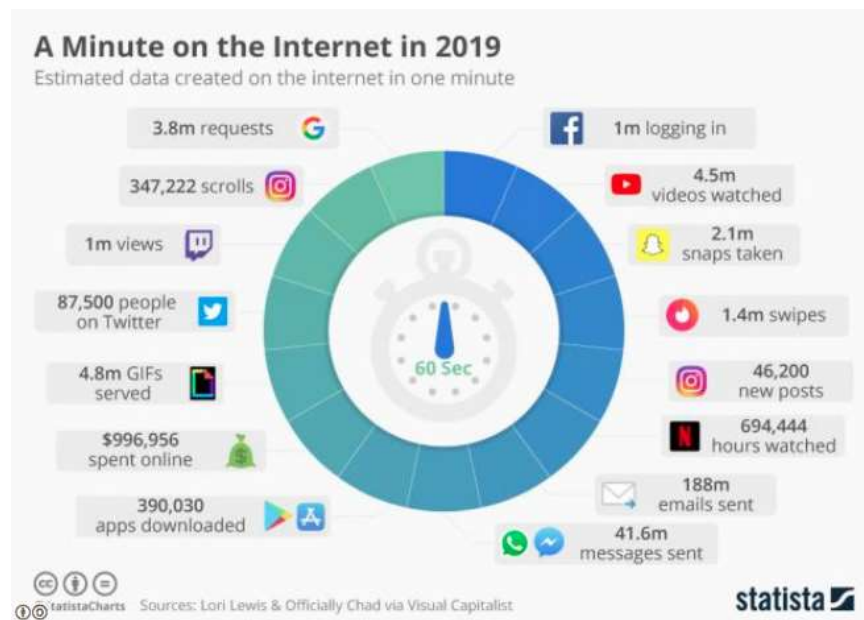


Figure 29.

Estimated data created on the Internet in one minute

To the environmental cost of digital technology, there is a human cost which is expressed through neo-slavery. According to a report by Amnesty International (2016), major electronics brands, including Apple, Samsung and Sony, are failing to do basic checks to ensure that cobalt mined by child labourers has not been used in their products. Likewise, Frankel (2016) explains that lithium-ion batteries are lighter and pack

more energy than conventional lead-acid batteries, and that these cobalt-rich batteries are seen as ‘green’ while relying on neo-slavery. Participants to the study rely on the Internet as a tool for green activism, in return employing this tool has an impact on both environmental health and human health (see 8.3.4 below). It requires a cost-benefit analysis to estimate the strengths and weaknesses of such an approach. Moreover, feelings of overwhelm and powerlessness, which many studies (Hoge, Bickham and Cantor, 2017; Ravishankar and Ponnamma, 2018; Renjith, 2017) cite as a result of information overload and constant connectivity, were not an issue for the majority of participants. Their intentional use of digital technology (digital minimalism) and balanced nature/screen time seem to promote overall human nature wellbeing.

Sustainable lifestyles can be considered a problem, as it is often implied that it requires a trade-off between immediate personal benefits and delayed collective benefits. Unlike Roy, Verplanken and Griffin (2015, p. 190), who found that people tend to attribute their unsustainable behaviour to “lack of thought”, participants in this study demonstrated that they conceptualised their own unsustainable behaviour as meeting some other sustainability goal. For example, keeping an inefficient digital technology routine means being able to impact the global environmental action. This fits with fundamental attribution error whereby people tend to overestimate the influence of personality or individual traits as driving others’ behaviour, and by contrast cite the situation as being the driver of their own actions.

8.3.4. Digital technology, embodiment, and mind/body disconnect

One of the aims of this study was to analyse Western dualisms from an ontological level. Discussing the human/nature dualism meant discussing other Western dualisms including the mind/body dualism or the individual/universal dualism. During the interviews, the practical aspects of a daily use of digital technology were discussed in the perspective of a separation between mind and body. If the digital revolution has first and foremost transformed human relationships, it also resulted in a more contrasted dynamic between the intellectual and physical dimensions of human experience. Acerbi (2019) portrays several dimensions of human experience that have been transformed as a result of the communication revolution. He explains that different phenomena such as the availability of knowledge, the opacity of interaction among unknown users, and the fluidity of knowledge have transformed people’s sense of being. These phenomena are focused on the mind and the intellectual activity over a physical experience of the world. Heim (1993) also argues that technological innovations are geared towards extending senses, minds, and emotions, providing humans with opportunities to enter worlds that they may have never entered, and a way to communicate and extend our thought processes. However, the fast pace of the digital world often creates a disconnect with our current realities. As Heim (1993) observes, not only do we face a breakthrough in the technology of computer

interface, but we face the challenge of knowing ourselves and determining how the technology should ultimately affect the society in which it grows.

During the interviews, it became apparent that participants were experiencing digital technology as something that is intellectually engaging, emotionally challenging and generally physically oppressive. Participants report feeling “drained”, “tired”, “lethargic”, after one hour and more of screen time. Many agree that they feel a disconnection between mind and body in the sense that online time often means physical immobility. In this respect, some participants equate body and nature, and argue that digital technology both creates a separation between human and nature, and mind and body. As this Australian participant explains:

I think it is probably fair to say that it does cause a disconnection. Often, if I’ve had to be in front of a screen for an excessive amount of time I have a great desire to just go out and lie on the grass and look up at the branches of the nearest tree. Then I feel better. Experiencing nature through the screen does not make me feel physically good, but it does have a positive mental experience for the time you are watching it.

Studies (Ravishankar and Ponnamma, 2018; Renjith, 2017) have described consequences of technology use, including negative impacts on physical and mental health. A report by the American Psychological Association (2017) shows that the attachment to devices and the constant use of technology is associated with higher stress levels. Participants to the present study confirm that for constant checkers, stress runs higher than for those who do not engage with technology as frequently. The addictive dimension of digital technology is part of its negative impact as this American participant explains, “I definitely get strained and tired with screen time, and have struggled with addictive use of the Internet. Last night, even, I stayed up too late and didn’t get enough rest, engaging my mind while ignoring my body”. A disparity between thoughts and reality, and thoughts and body is often perceived by participants. Bodies are the segue between the mental and the real, and the virtual and the real. A common example is what an American participant calls the “instagramming situation”. This implies the urge to take pictures of nature to share on social media such as Instagram. This American participant also illustrate this phenomenon:

I feel because we have our smartphones, we constantly are in touch, and even when we want to get away from it, we use it to take pictures, which have us take ourselves out of the moment. Yes, I sound like that stupid meme “No phones, just living in the moment”.

Heim (1993) argues that, with technological advancements, humans have lost the ability to sync mind with body and thus seeing and realising the world and reality as they are. He adds that, people do not need to develop more digital intellectual experience, but to re-experience their physical energy.

Participants from both countries relate to this divided mind/body experience when online, yet American participants rely more on online nature experience, notably via social media, than Australian

participants do. As an example, this American participant explains that the Internet can provide positive nature experience when one cannot travel or lives in an urban area:

I cannot get to many of the diverse natural environments around the world and I can get stuck in a research bubble when I do not consume information outside of my PhD work. Technology re-sparks my joy for nature when I see interesting new marine species that were just discovered in an Instagram post, for example. It helps me remember that there is more to the tiny part of the world I live in.

On the contrary, Australian participants are more critical of online nature experience and bringing technology to nature. For instance, this participant explains that she likes to spend time in natural surroundings but finds that “with many people glued to their screens or trying to get perfect photos for their Instagram, it ruins it a little”. A majority of Australian participants favour real life nature time:

There is nothing like actually being outside with other living beings, not just pictures of them. Digital-based natural experience can be inspirational at times, but actually connecting with nature physically (usually outdoors) is the most rewarding. I think the digital experience eventually leads to disconnection from nature and the body.

As the interplay between humans and machine becomes inevitable and the need for interface grows, Hayles (1999) notes that it engages in the erasure of embodiment from subjectivity. Via the concept of posthumanism, she investigates the social and cultural processes that led to the conceptualisation of information as separate from the material that instantiates it. According to Hayles (1999), subjectivity equates with the mind, which shows a strong denial of the impact that our bodies have on the way that we think and act. She (1999, p. 18) criticises “the cultural perception that information and materiality are conceptually distinct and that information is in some sense more essential, more important and more fundamental than materiality”. Hayles (1995, 1999) argues that the reality of being disembodied into an electronic device (via a virtual self) is related to the human desire for transcendence, immortality and perfection. Likewise, many participants to this study stress the reality of hunching over a computer, eyes dry and fatigued from long screen exposures, and wonder how they forget about the physical discomfort that they experience as they immerse into virtual worlds.

The mind/body disconnect generated by digital technology usage has inspired research on the theme of technology and mind-body integration. Renewed interest in theories of embodiment has emerged in conjunction with advances in ubiquitous computing and the development of technologies. Farr, Price and Jewitt (2012) explain that the very nature of technologies such as tangible, multi-touch, sensor and mobile technologies offers opportunities for exploiting a wider range of perceptual-based experiences than traditional desktop computing. Primarily they offer opportunities to exploit more bodily-based physical experiences in new ways, for example, through manipulation of physical objects linked to a variety of digital

augmentations. This enhances contextually based experience in real world environments through mobile devices, and fosters new forms interaction and new ways of thinking. In a different manner, Hayles (1999) calls for symbiosis with technology through posthuman forms – cyborgs and extended bodies. The primary issue remains how we would incorporate robotics, prosthetics, and the Internet to facilitate our relationship to technology, making it more materially comfortable to sustain. For instance, Kac (1997) announced the implant of microchips as a means of liberating the body from the machine, but also as an attempt to freedom because of the permeability of information entailed to connectivity and networked communication. If these technological implementations are yet to come, the overall trend among participants to the present study is to equate freedom with a consciously controlled and limited digital technology use.

8.4. Nature, digital technology and wellbeing

8.4.1. Nature exposure and digital technology

According to Kelly (2016), technology should be considered a force of nature, evolving along the same principles as any living species. Some participants view digital technology as part of nature, yet a part of nature that is destructive to the environment itself. But the bridge between human and nature, toward humanature, is more present in the fact that digital technology use is balanced with nature exposure than in reconciling the notion of technology with something natural rather than artificial. I explained in the previous chapter (see chapter 7, point 7.5), the physical, mental and emotional effects of nature exposure on humans, and how spending time in nature promotes health and wellbeing. An important question is: can nature exposure help foster a healthier relation with digital technology? Based on scientific findings (Martin and Dahlen, 2005; Martin, Pahl, White and May, 2019; White et al., 2019) on the effect of nature on human health and wellbeing, one can argue that nature exposure can only help with problems related to digital technology such digital addiction, anxiety and depression. Although there are few studies on the subject, many studies show that nature is used with digital devices and sought after online (Thomas, 2013). The concept of biophilia developed by Wilson (1984) states that humans have an ingrained love of and drive toward nature. According to Thomas (2013), biophilia can also be found in the human invention that digital technology is. From the many nature metaphors – clouds, rivers, streams, viruses, and bugs – present in the language of the Internet to the images of forests, waterfalls, animals and beaches that adorn digital screens, Thomas questions the links between nature and cyberspace, and the importance of nature online. She explores the strong thread of biophilia which runs through our online lives, a phenomenon she calls ‘technobiophilia’, or, the ‘innate attraction to life and lifelike processes as they appear in technology’. The theory on technobiophilia argues that nature can alleviate mental fatigue and enhance human capacity for directed attention, soothing human connected minds and easing relationships with computers.

One of the main differences in the findings of the present study is that on average Australian participants have a healthier and more detached relationship with technology. They also engage more assiduously with nature. Digital technology can create a mind/body disconnection, and many participants argue that, on the other hand, nature exposure helps them achieve mind-body integration. American participants are more critical of digital technology negative effects on psychological and physical wellbeing, yet they do not experience nature exposure as often as Australian participants do. On the other hand, Australian participants report spending more time in nature, less time online, which, in turn, seems to foster a more peaceful relationship with technology. This Australian participant explains how he uses technology intentionally:

I believe we should be using digital technology less in modern Western culture at large and more efficiently when we do. To get more out of the experience in less time. Staring blankly at a screen, not engaged with what you are really looking at, is definitely a separation of body and mind. But interacting in an engaged way – as I am doing now, or as I was doing earlier today as I designed wine labels that I loved, or when I watch a mindfully composed nature documentary in an aware state is a completely different thing.

All participants lived in urban or semi-rural areas, those closer to nature were farmers or ecovillagers, yet owned urban farms or lived in ecovillages that would not be far from big cities. A reported lack of nature is more important in American answers making me wonder how different American urban areas are from Australian urban areas and if nature is more present. Australia's area is 7 692 300 km², which is the size of the United States without Alaska (and is fourteen times France). On average, Australia has a population density of 3 per km² while the United States has 33 per km² (10 times more) (as a note, France has 106 per km²). Natural spaces and wilderness areas make up for a large part of the country. According to a study by Pew Environment Group and Nature Conservancy (2008), more than 40% of Australia is still wilderness. The extent of Australia's wildlands ranks with the Amazon rainforest, Antarctica, Canada's boreal forest, and the Sahara as the largest on the planet. Traill (as cited in Mongabay, 2008) observes that:

Few Australians realize the extent and quality of their own wilderness. We just take what's here for granted, not realizing how rare it is. As the world's last great wilderness areas disappear under pressure from human impact, to have a continent with this much remaining wilderness intact is unusual and globally significant.

So, the United States are more populated, urbanised and digitalised than Australia. Australia may be considered a younger version of the US. This may confirm the participants' answers on being less exposed to nature in the US than in Australia, thus asserting a correlation between nature exposure, especially close, mundane nature, and healthy digital habits. The following testimony by an Australian participant is interesting in this regard:

When I am watching a nature documentary I am still getting some physical experience of the images I am seeing and likewise when I am in a natural setting I am still getting an intellectual experience of that setting. In terms of what I am experiencing I live in a bush block so even if I am watching something and feel a little disconnected from the images as soon as I look up from the screen I am surrounded by nature and therefore no longer experience that slight disconnect.

There is an obvious tension in aiming for a balance between digital usage and nature time. As Levin and Mamlok (2021) point out, living in a hyper-intense society makes delayed responses or reactions to contents irrelevant. The rationality of network society renders the idea that effective communication cannot be attained unless there is constant activity throughout the network. A majority of participants refuse constant connectivity. They intentionally disconnect from time to time (see digital detox, chapter 5, point 5.3.5) and are usually not connected all day. On average, 47% of American participants and 32% of Australian participants spend 2 to 5 hours online on a daily basis – with an important amount of Australians (25% instead of 14% for the Americans) who spend 1 to 2 hours online a day. In short, with Americans spending about half of their time online and experiencing less nature exposure, and Australians spending about a third of their time online and experiencing more nature exposure, findings show a positive correlation between nature exposure and healthy digital habits. The more nature time, the more positive the outlook on, and the experience of, digital technology. The less nature time, the more negative the outlook on, and the experience of, digital technology.

8.4.2. Digital technology and conceptions of time

We are time. We are this space, this clearing opened by the traces of memory inside the connections between our neurons. We are memory. We are nostalgia. We are longing for a future that will not come. (Rovelli, 2018, p. 43)

The Internet, mobile devices, and other digital artefacts offer us new ways to experience and understand time. Some concepts linked to the digital society such as ‘the acceleration of time’, ‘real time’ communication, ‘multitasking’, or ‘globalised time’ are attempts to describe the situations that people face in the new digital ecosystem. The question of the nature of time is one of the oldest debates there is (Heidegger, 1927; Rovelli, 2018), going from seeing time as a thing that exists in measurable form to something that is alive and part of human beings. As Rovelli (2018, p. 15) asks, “Do we exist in time, or does time exist in us?” Living in society means constantly interacting with various indicators of time and different time scales, which mix with individual experience, memory, intuition, and personal sense of the passing of time. Adam (2004) uses the term *timescapes* to describe the complex mix of different biological and mechanical rhythms, with different speeds and tempos, in which human beings live. Participants to this

study observe how these timescapes coexist with the rhythms and times of the digital world that runs parallel to the real world, sometimes in harmony, sometimes in confrontation. Time spent in nature is perceived as different from digital time, the majority of participants report feeling more “present” when in nature (“Time flows, expanding and contracting” - AUS). They describe time as a continuous flow that has a duration, and constantly moves from the present to the past. This is in accordance with Bergson’s (2014) theory on time. For Bergson (2014), time is not an indivisible whole and cannot be reduced to quantifiable discreet units. Instead, it is an internal, subjective state that often clashes with its technical representations.

While human time is irreversible, limited, and subjective, digital time is reproducible, reversible, and infinite. Some participants experience these new temporalities as time conflicts that are native to the net itself. They view online time as part of a globalisation of time that is happening in Western culture. As an American participant points out “outdoor time is unstructured and free”. Participants equate nature time with cycles and slowness and technology time with rapidity and constant focus. Castells (1996) uses the concept of “timeless time” to reflect on what he saw as the waning of biological and social time in favour of homogenous, globalised time in network societies. Castells (1996) argues that temporality is transformed in the information age, and human experiences of time dissolve into a timeless cyberspace. Most participants to the study use digital technology intentionally and moderately, still many report losing the sense of time when online (“I am trying to restrict my time on the computer more, as I notice I can be ‘trapped’ into scrolling through Facebook for too long, and I can see it’s addictive” - AUS). According to Wertz, Ronda, Czeisler and Wright (2006), this retrospective underestimation of time (looking back, and thinking that less time has passed than has actually passed – associated with a slowed-down internal clock) results from ‘cognitive inertia’ after being online. Just like the cyberspace has changed our relation to space by offering new virtual dimensions, it has changed our relation to time by adding a different timescape to the real life. Virilio (1997) notes that in the physical world the ‘when’ is linked to the ‘where’, so when you enter the digital world, you evolve in a different time than the physical world where your body remains. He suggests that we are losing our time reference because instant communication and network time are “killing” the present, separating it from its place and context, so that the concrete presence of the communicative act is no longer important. Participants explain that digital time favours constant connectivity (“It’s 24/7” - US) which can be oppressive, and in comparison, time spent in nature is described as “grounding” and “relaxing”.

Just as capitalism has imposed a global market, it has imposed a global temporality. According to Hassan (2007), there is an acceleration of flexible time as networks modulate and converge in a very wide range of social experiences of time. Hassan (2007) believes that the true temporality of networks is asynchrony, because the huge ecosystem of the Internet allows each user to engage with different spaces and times independently of their real local time. Participants rely on the Internet to spread a green message

and share pro-environmental values and they connect with people on a global scale on a daily basis. So, what is described as a homogenous, globalised time can also be seen as an almost infinite fragmentation of different synchronous and asynchronous time contexts reflecting the reality of each individual connected online. Local and global time were part of my research process as well and of interacting with participants living in two different countries. For all participants as digital green activists, the tension between local and global time, and digital and real time is part of their daily lives. The network society radically alters the relationship to clock-time, to local and global social time. It does not replace or reject it. It displaces it, offering new ways of controlling and experiencing time. In contrast to the experience of time in nature, online time feels rushed. This can be explained by the fact that nature exposure has positive effects on human health and restores body rhythms when out of balance (see chapter 7, point 7.5). As De Kock, Zhou, Joiner and Wiener (2021) argue, slowing the body slows down time perception. Likewise, the awe effect that nature elicits (see chapter 6, point 6.4) expands people's perception of time according to Rudd, Vohs and Aaker (2012). Feeling awe slows down time and makes one focus on the present moment. In this respect, the confrontation of digital time and natural time evokes the human/nature dualism – confronting technology and nature – and the mind/body dualism – confronting the intellect and the physical experiences of screen time and green time.

8.5. American and Australian similarities and differences and conclusion

The survey and interview questions on digital technology provided the most varied views from both groups of participants. The last two chapters on nature and culture report more similarities than differences among Australians and Americans, but the chapter on digital technology reports the most differences, yet still many similarities. As members of digital societies in the age of globalisation, American and Australian participants share the characteristics of networked individualism, transpatisation and cognification. Their relationship to nature in the digital age evolves in the context of an increasing sophistication and integration of computer hardware, software and networks. Sense of place and belonging are redefined by the fact that the cyberspace exists jointly with physical space, and can be seen as a hybrid space, both virtual and physical. The daily use of mobile technologies, especially in natural surroundings, blurs the traditional borders between physical and digital spaces, and between nature and technology, which is enhanced by our globalised world. Both American and Australian participants share the dilemma between wanting to live an eco-conscious lifestyle and relying on a polluting technology. Americans, more than Australians, view digital technology as environmentally destructive while Australians tend to focus more on the positive aspects of the technology and how it can nurture the human-nature bond. Both groups of participants experience a mind/body disconnection when online and, if all participants practise digital minimalism,

Australians generally express less interest in being connected than Americans. At the same time, due to the differences between each country's physical and geographical context and their resulting limitations on access to nature, American participants rely more on online nature experience while Australian participants rely more on a physical contact with nature. Australians have a more detached, peaceful relation with digital technology, and Americans report more negative feelings, criticise technology more openly and express less appreciation of it. Australia is less urbanised and populated than the US. A physical access to nature, especially ordinary nature close to home, is more common and part of daily routine. Nature exposure is beneficial for human physical, mental and emotional health and wellbeing. Nature exposure may influence positively digital technology habits and be used as a tool to prevent or help digital-related problems (digital addiction, anxiety, etc.).

9. Conclusion

*We cannot expand our self, and our collective self, without making holes in our heart.
We are stretching our boundaries and widening the small container that holds our identity.*
(Kelly, 2016, p. 21)

Human, nature and digital technology. These three notions, not viewed separately but in their relations to each other, were centrepieces of the thesis. This thesis positions itself from the point that nature and culture are intertwined and impossible to comprehend without the other. It is not nature *or* culture, but nature *and* culture. Western civilisation has built its culture on the basis of separation, of viewing concepts in isolation and in opposition. The pro-environmental trend in contemporary Western society questions this culture of separation and offers the alternative of seeing the world as an interconnected system of relationships between all beings. The current pro-environmental trend offers a shift in worldview, stepping away from the dominant worldview towards an environmental one.

9.1. Addressing research questions

- (1) Is the human/nature dualism prevalent in pro-environmental groups/individuals?
 - (1.1) Has it evolved?

The human/nature dualism is prevalent in pro-environmental communities but results may suggest that it is evolving towards a humanature reconnection. Pro-environmental communities are part of Western civilisation and exist within Western culture. They developed as an attempt of Western civilisation to provide solutions to the environmental crisis that it has created as a result of humans' actions on nature. This study found that pro-environmental individuals were usually influenced during childhood and shared environmental values with their families or kin. In Western culture, such environmental values have their roots in environmental writings going from 19th century transcendentalist authors such as Thoreau (1854) and Emerson (1836) to environmental activists such as Muir (1911), or countercultural authors such as Carson (1962) and Ehrlich (1968). These ideas and values were transmitted by older generations to younger ones. Both the traditional Western view of the human/nature dualism (related to the DSP worldview) and the pro-environmental view promoting humanature as one were present as part of their environmental education. It is important to acknowledge that this study treats the pro-environmental trend as a product of Western culture and an attempt of Western civilisation to heal itself from its destructive actions towards the

environment (IPCC, 2014). In the context of pro-environmental communities, the traditional separation between human and nature is predominant but pro-environmental individuals intentionally focus their attention on environmental values and beliefs (in accordance to the NEP) and, as a result, are gradually turning separation beliefs into humanature reunion beliefs. The point is not so much to understand whether they still view human and nature as separate or whether they see them as one, and which view is predominant, but to understand that both views coexist which means that, as this study's findings show, the Western mind is in a process of evolution and redefinition of itself in order to adapt and respond to the new environmental situation.

(2) How is human identity defined in regard to nature?

Human identity is defined as intrinsically linked to the natural environment and is experienced through different dimensions, namely the physical dimension, the intellectual dimension and the emotional dimension. Developing on the humanature views of participants, human identity in general, and their self-identity in particular, is conceived as a rich, holistic experience that expands beyond the actual limits of one's skin. The theory of expanded self, environmental identity, nature connectedness, etc., all confirm the opinions of the participants which are that human identity is interconnected to the rest of the living and non-living things. In regard to nature, human identity is defined through the three facets of the physical, intellectual, and emotional experiences. Each facet can be experienced individually (meaning that one can intentionally focus his/her attention on the emotions or the thoughts processes or the physical sensations one has when in nature) but they are ultimately inseparable (meaning one can focus his/her attention on one or the other but one cannot but experience all the facets at once). More precisely, this study finds that, in contemporary pro-environmental communities, the different facets of the humanature identity are as follows:

- The physical experience of nature has calming, grounding and healing effects on human bodies which results in a sense of feeling at peace and at home in nature.
- The intellectual experience of nature means integrating data (through books, videos, discussions, etc.) that promotes the humanature tie (e.g., ecosystems, environmental identity, etc.) and develops a comprehension of oneself as part of nature.
- The emotional experience of nature is mitigated between negative emotions such as fear, sadness, guilt and anger, and positive emotions such as peace, joy and awe. The first set of emotions is experienced when one acknowledges the environmental degradation caused by human activities, and the second set is experienced during nature exposure. Positive and negative sentiments can be intertwined (for instance, finding trash during a hike in nature). I will add a note on the physical, intellectual and emotional effects of

digital nature – as opposed to physical, real nature – on human identity. Digital nature, or the experience of nature that is made online via online texts, blogs, videos, pictures, etc., also has reconnecting, positive effects on human beings. Just like with real nature, digital nature (e.g., watching nature pictures on Instagram) has calming physical effects. From an intellectual perspective, the Internet provides access to human nature knowledge (ebooks, articles, blogs, documentaries, etc.). And, emotionally, it triggers the same vast array of reactions going from negative emotions (e.g., reading about climate change on Twitter) to positive emotions (e.g., watching an inspiring documentary such as *2040* by Gameau, 2019).

(3) Why do we separate from nature?

The mind separates us from nature. The body takes us back to it. Starting on the concept of a human/nature dualism, I broadened the debate to the concept of mind/body dualism. As explained in research question (2), human consciousness has the ability to be specific and all-encompassing at the same time. For instance, one can focus his/her attention on the intellectual activity or on the bodily sensations, and still experience the other dimensions. When I say that the mind separates us from nature and the body takes us back to it, it means three things. First, there is a mind/body dualism, second, there is no mind/body dualism, and third, the dualism, or absence of it, is a matter of perception. There is and there is not a dualism based on how one perceives the world. This is related to the concept of worldviews. Western civilisation has been defining itself as separate from nature for centuries. Worldviews are part of an intellectual process and of how the mind understands reality. In this respect, a worldview is built on thoughts which are often, yet not always, based on words and language. Worldviews include lots of other factors as they express themselves through, and are influenced by values, ideologies, religion, economics, education, politics, etc., but discourse (words and language) are the common denominator. As I explained in the literature review, language plays an essential role in creating a screen separating us from direct experience. A physical, sensuous experience of reality tends to bypass the mind and to lift that screen. So, we separate from nature because Western civilisation and culture has long been based, and is still in a way, on a human/nature dualism, promoting such values throughout the socialisation process. We separate from nature because we were taught to do so. As this study found, conversely, we can reverse that effect and teach ourselves differently, as it is the case for the pro-environmental participants who transformed their worldview by educating themselves with environmental values. Independently from education and socialisation, we separate from nature because an intellectual experience of life has been prioritised over a sensuous experience of life. This has strengthened the dominant traditional worldview. This is why nature exposure has been praised for positively impacting pro-environmental values and actions. Nature exposure is a body-based experience, more than an intellectual experience (although, as always, it is a matter of focused attention and all dimensions are

present). Nature exposure, by taking back the individual to his/her senses, is a form of wordless education that promotes the interconnection of all things.

(4) To what extent does digital technology impact human relation to nature?

Digital technology impacts human relation to nature in different ways. As an artefact of contemporary Western culture, digital technology has changed how humans experience reality, and this includes nature. On a basic level, digital technology has transformed the human-nature relation in both a positive and a negative way. It has positively impacted the human-nature tie because it can be used as a tool to educate oneself on conservation issues, to connect with like-minded people such as eco-activists, to entertain oneself with inspiring images, videos, texts, etc. of/on nature, and ultimately to develop pro-environmental values and worldviews. Digital technology has negatively impacted the human-nature tie because online time can be addictive, and because it often means indoor time and immobile time that promotes the intellectual experience over the physical experience. In this way, it can be disconnecting. The same tension between intellect and body exists when using digital technology outside, in nature. Digital technology can positively impact the human-nature connection when used as a tool to heighten the sensuous experience of nature (for instance, using the GPS when hiking). And it can negatively impact it when used to inhibit the sensuous experience (for instance, instagramming on the beach, which intellectualises the experience of being on the beach). In the context of this study with pro-environmental individuals, digital technology has been described as more positive than negative because participants used it moderately and intentionally, thus bypassing potential negative effects.

(5) Do PEBs differ depending on their national cultural origins?

In this comparative study between the United States and Australia, PEBs did not differ. But the human-nature relationships, and how one connects to nature, differed. Pro-environmental behaviours – also known as green, sustainable, or environmentally-friendly behaviours – are defined as behaviours in which individuals take protective actions toward the environment. The ways American participants and Australian participants took protective actions toward the environment were similar. I surveyed and interviewed participants from ecovillages, community gardens, urban farms, environmental organisations and zero-waste initiatives, in both countries, and all participants had the same pro-environmental approach. They included responsibly engaging with the environment by reducing waste, recycling, composting, purchasing sustainable products (e.g., local food, green cleaning products), conserving water or energy, changing travel modes (e.g., from driving to walking or cycling), buying an electric vehicle or building an off-grid home.

Their actions were individually initiated and then broadened to the online/offline community in order to lead to benefits of climate change mitigation and sustainability.

(6) Can a cross-cultural comparative analysis of PEBs benefit current discourses on environmental sustainability?

This research question, like the one above, would have had better aim to be formulated on the basis of human-nature relationships and representations. As I said for research question (5), PEBs are not different in the United States and in Australia. But the cultural representations of nature and the resulting human-nature relationships are different. Cultural factors influence human behaviours, and, in this case, the differences between American and Australian cultural factors result in different human behaviours in each country. American participants report living in a more urbanised and digitalised environment than Australians, and Australian participants report living in a less digitalised and more natural environment than Americans. For American participants, the concept of ordinary, mundane nature – the type of nature that one can find in a backyard or in a city park – is valued as an important natural asset and nature representation in Western culture, and is key in nurturing the human-nature tie. This approach praises what is known as urban wildness. For Australian participants, the predominance of wild nature, and the concept of the bush as a typically Australian representation of nature that is in between urban settings and wilderness means that urban wildness and mundane nature are less valued and considered somewhat less authentic than wilder areas. The nature that one deems important – whether that is acres of wilderness or a wild patch of grass in a parking lot – will be considered worth discussing and/or protecting in current environmental debates. So, a cross-cultural comparative analysis of the different American and Australian representations of nature would certainly benefit current discourses on environmental sustainability.

9.2. Research limitations

A research limitation is a systematic bias which was not or could not be controlled by the researcher, and could potentially affect the scientific quality of results (Price and Murnan, 2004). Two types of limitations were identified during the research, methodological limitations and theoretical limitations.

9.2.1. Methodological and theoretical limitations

9.2.1.1. Sampling

The first major limitation of this research was identified in the sampling of participants. Some sampling limitations identified in previous literature include Internet penetration differences of sample populations, using student populations, small sample sizes, an unbalanced gender ratio and the inability to ascertain the real nationality of members in a community. This research aimed to circumvent these sampling issues by creating a cross-cultural sampling framework. This framework ensured that the communities selected for sampling were from a defined geographical country, and had a wide range of different social roles within. Student populations were partially used for both groups but were predominant in the American group creating an imbalance in the age ratio. Each country selected had similar Internet penetration rates. The implications of the sampling framework, and the addressing of problematic sampling issues, mean that the data analysis was more robust, and biases arising from the sampling were mitigated. However, one major sampling limitation that warrants discussion is the gender bias in using pro-environmental individuals and communities online. It was evident both from the sampling and the analysis that most of the survey participants were female. Previous studies have found that there are gender differences in language use where women tend to use more words related to thoughts and emotions than men (Newman, Groom, Handelman and Pennebaker, 2008). Within the online community setting, women and men also behave differently, with researchers describing how women tended to ask more questions, supplicate, apologise, support others and justify themselves more than men (Herring, 1993). The implications of these differences could have had an impact on the overall crosscultural comparative results. It could be suggested that a more gender-neutral community could have presented different findings. The large size and global scope of the network in the context of pro-environmental trends made it difficult to finding similar numbers of male and female in the case of a netnography. However, it is accepted that using a gendered biased sample could have had an impact on the results and would have been a limitation in the analysis. This was partially tempered by the fact that the gender ratio was balanced for the interviewees sampling.

9.2.1.2. Generalisability

This thesis focused on newly emerging integrative worldviews such as the New Environmental Paradigm (NEP) and on pro-environmental trends more than on the modern and traditional worldviews (i.e. the Dominant Social Paradigm, DSP). This is because I was interested in the worldviews that appeared to have the greatest potential in terms of initiating and supporting social-cultural change in the direction of more sustainable societies. The low generalisability of the results is then argued to be a major limitation given that pro-environmental individuals represent a minority in American and Australian Western cultures. It is important to note that generalisability in qualitative research has long been discussed where opponents believe that results from a small number of cases cannot be generalised to larger populations (Polit and

Beck, 2010; Smith, 2017). However, this criticism has been treated as a nonissue by proponents as the primary role of qualitative research is to interpret rather than measure or predict the meanings of agents within social contexts (Malcolm, 2004). Indeed, researchers (Charmaz, 2006; Creswell, 1998; Seidman, 2013; Tashakkori and Teddlie, 1998) argue that the aim of such research is not to sketch a picture that is generalisable towards the larger population, but to generate in-depth insight into, and rich descriptive detail of, the views of particular groups – in this case pro-environmental individuals whose worldviews have considerable potential for issues of sustainable development.

A focus on a pro-environmental worldview is not meant to suggest that this is the worldview other individuals should aspire to. One of the goals of this thesis was to show that insight into the differences between worldviews can empower one to become more reflexive of one's own worldview position as well as of the assumptions undergirding environmental policies and solutions. It is also important to note that the sphere of research was limited to the West, both in the actual data collection (which took place in both Australia and the US) and in the theoretical framework and literature review that I have primarily relied on. The theoretical frame and understanding of traditional, modern, and postmodern worldviews clearly take modernity as reference point, and could thereby be argued to be 'Eurocentric'. Even though Indigenous cultures (i.e. Aboriginal culture and Native American culture) were the focus of some of the participants' answers, the human-nature relation was analysed and understood through the Western view spectrum. There has been a persistent debate among scholars over what is considered legitimate knowledge. This debate has implications on ways of knowing, organising society and responding to environmental challenges. Akena (2012) argues that Western culture is a hybrid of different knowledge adopted through European global expansion. In this respect, indigenous knowledge and culture are not recognised by the DSP based on their differences. Zak (2020) argues that the differences between Indigenous and Western cultural conceptions of the Earth is a major cleavage between both communities and a source of tension and misunderstanding. For instance, Native American religious beliefs in communal ethics, the belief in the Earth and nature more broadly being a source of spiritual fulfilment and enlightenment, has encouraged Native Americans to work to safeguard the environment. These attitudes have been described as inspirational and sometimes superior to Western culture by participants to this study and are often praised in the context of the NEP, yet they are not valued by mainstream Western culture.

9.3. Research contribution

The main significance of this study exists in its contribution to the underdeveloped research on nature-human-digital technology relationships. While many studies (Callicott and Nelson, 1998; Cronon, 1995; Oelschlaeger, 1991) have acknowledged the limiting beliefs fuelled by Western culture on nature (Western

dualisms, etc.), little is known about the association between digital technology and nature in their relationships to humans. The findings from this study make several contributions to the current literature and could benefit the fields of behavioural science, critical environmental theory, environmental education, as well as environmental policy. I will use the following drawing to summarise the study's findings and to exemplify the relations between nature, culture and digital technology as they were detailed in the discussion chapters (chapters 6, 7 and 8). It will provide a schematised overview of the general results of the study (i.e. this figure illustrates the predominant trends of the results within each country, leaving aside the subtleties which are detailed in the discussion).

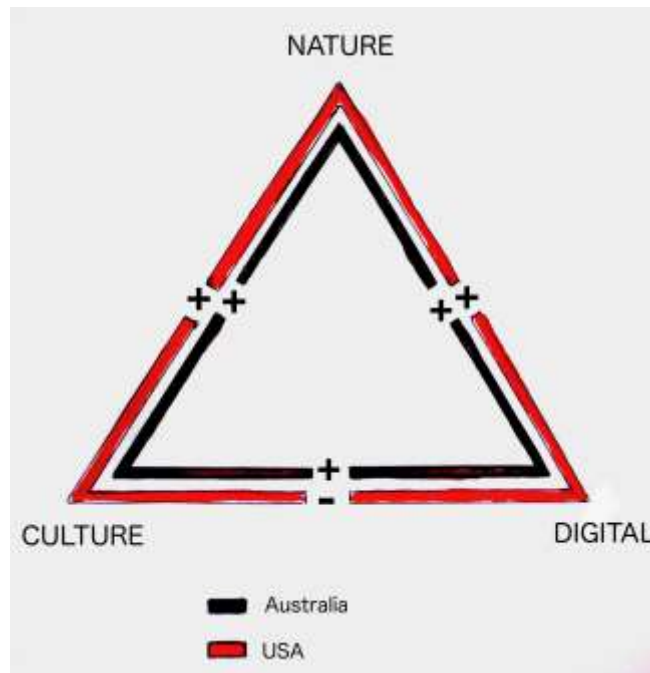


Figure 30.

The humanature identity triangle in relation to digital technology

First, as a triangle, it is important to acknowledge that each side creates a two-way relationship between each concept (e.g., the nature-culture side means that nature influences culture as much as culture influences nature, etc.). Second, it is interesting to note that these relationships differ depending on their national context, whether Australian or American. I have simplified these in-between concepts dynamics as being positive or negative depending on whether they benefit a harmonious, life-sustaining relation between humans and nature, or not. Or as different scholars put it, whether they promote a pro-environmental worldview such as the New Environmental Paradigm (Dunlap and Van Liere, 2008), are part of the Symbiocene (Albrecht, 2014, 2016, 2019), generate biocentric, rather than anthropocentric, values (Lanza,

2009; Taylor, 1983), are environmentally sustainable (Callicott and Mumford, 1997) and promote environmental identity, human physical, emotional and mental health, and pro-environmental behaviours (Albrecht, 2019; Clayton, 2003; Kollmuss and Agyeman, 2002, White et al., 2019). Based on the abundance of studies on the relation between human, nature and self-identity, notably via the concepts of environmental identity and extended self (Belk, 1988; Clayton, 2003; McKinnell, 2011), the triangle represents human identity. Human identity is the link between nature, culture and digital technology, both from an individual and a collective perspective (i.e. this includes the individual self and the collective self), and in the context of a humanature continuum and individual/universal interconnection. These three concepts are understood and defined by the way humans identify themselves in relation to nature, culture and digital technology, and in return, human self is shaped by these different natural, cultural and digital environments. This means that, in a global environmental culture, Australian and American participants share a phase in their identity both on an individual level and a collective level, a phase in which nature, culture and digital technology both enable them to extend their identity to the rest of the living, and support the individual to universal transition. This also means, based on the differences between Australia and the US, that natural environments play a key role in supporting self extension via nurturing a pro-environmental culture, instead of a culture based on negative emotions towards nature (i.e. fear, guilt, sadness, etc.). The Australian triangle is inside the American triangle to illustrate the fact that Australia appears to be a younger (i.e. less connected, more nature-based) version of the US. The following table summarises the interactions between nature, culture and digital technology for each country.

Table 8.

Comparative table of interactions between nature, culture and digital technology in Australia and in the US

		AUSTRALIA	USA
Nature-digital	nature => digital	<u>Positive</u> <i>The effect of nature on digital technology, via both real and digital nature exposure, is helpful and beneficial.</i>	
	digital => nature	<u>Positive</u> <i>Digital technology is viewed as a positive tool to nourish a connection to nature and strengthen one's environmental identity.</i>	
	nature => culture	<u>Positive</u> <i>Nature, via real and digital nature exposure, has a positive repercussion on culture because it develops and reinforces a pro-environmental culture.</i>	

Nature-culture	culture => nature	<u>Positive</u> <i>Culture, when it is pro-environmental, has a beneficial effect on nature because it aims to respect, and protect natural environments.</i>	
Culture-digital	culture => digital	<u>Positive</u> <i>Australian participants were less connected than American participants and Australian culture, via easy access to nature places, helps nature exposure and real nature time.</i>	<u>Negative</u> <i>The American culture, contrary to the Australian culture, is more digitally orientated and more time is spent online. In this respect, the effect of culture on digital usage is negative.</i>
	digital => culture	<u>Positive</u> <i>Australian findings show a positive digital technology-to-culture correlation because of less time spent online. They report less solastalgia and digital solastalgia.</i>	<u>Negative</u> <i>American findings show a negative impact of digital technology on culture because too much online time results in both solastalgia and digital solastalgia.</i>

9.3.1. Theoretical and methodological contributions

9.3.1.1. Nature, digital technology and human identity

From a theoretical perspective, this study has contributed to the literature on the human/nature dualism by demonstrating that this concept is evolving toward a human-nature reunion in digitalised pro-environmental communities. More precisely, it has contributed to developing the literature on nature, digital technology and human identity. Nature connectedness and environmental identity are positively impacted by digital usage and Internet connectivity. The hybrid space formed by the interrelation of the cyberspace and the physical space is questioning the way human beings view and define themselves. The virtual self and the physical self are juxtaposed, blurring the limits between the online and offline worlds. The humanature relation adds to this redefinition of identity, and deepens the debate on human identity in contemporary Western civilisation. Pro-environmental communities represent a shift in worldviews from the DSP to the

NEP. Their relationship with nature is linked to an extension of the self to the natural environment. Likewise, the Internet is redefining the self-identity. The dematerialisation and the Internet mean that people are now able to connect with a much broader community. As Belk (2013) explains, the Internet permits a reformulation of the extended self through different processes such as dematerialisation, reembodiment or co-construction of the self. If, as Belk (1988) posits, the individual self is made up of an inner core self as well as aggregate selves ranging from family to neighbourhood to nation, then it is clear that both natural and digital worlds are to be integrated into human identity.

9.3.1.2. Gender divide in environmental attitudes

The findings from this study contributed to the gender-environmental conservation interrelation. Many studies show that the human-nature relationship is not gender-neutral, especially so in developing countries (Aditya, 2016; Nebasina, 1995; Shiva, 1988). Gender differences regarding the perception of and behaviour toward environmental problems are well documented: across countries, women express higher concern about the environment and are more likely to act pro-environmentally than men (Goldsmith, Feygina and Jost, 2013; Ramstetter and Habersack, 2019). Yet, in a Western context, less is said about the dynamic between gender and conservation, and about the role of women in the current environmental debate and in environmental action. The present study shows that Western women engage in conservation action in an individual way, and by using the Internet as a platform for debate. From zerowaste initiatives to community gardens, the sites which were contacted to find participants were often fronted by female influencers. We may question whether this is a reflection of traditional gender roles as this type of subactivism (i.e. individual online activism) is initiated from home and values eco-friendly lifestyles through home-related activities (including food, cleaning, gardening, childcare, reducing plastic at home, etc.).

Researchers (Aditya, 2016; Nebasina, 1995) argue that women, being primarily responsible for domestic and household management, interact more intensively with the natural environment than men. Consequently, they are more likely to suffer from a degraded home, neighborhood, and city environment and to shoulder more of the burden that goes with living in environmentally destructive housing and communities (Etta, 1999). On the other hand, Goldsmith, Feygina and Jost (2013) explain that women have greater willingness to acknowledge ecological problems and risks and to pursue actions that are beneficial for the environment because they engage in less system justification (i.e. the psychological tendency to maintain certainty and security through motivated perceptions of the status quo) than men. There is the need to understand the various ways women have actively participated in environmental protection and management with a view to integrate them into environmental management programs. Ramstetter and

Habersack (2019) argue that with the continuing underrepresentation of women across legislatures, environmental policies are disproportionately shaped by men's preferences.

9.3.2. Empirical contributions

9.3.2.1. The effects of nature exposure on digital habits

An unexpected finding from this study was the relation between nature exposure and digital habits. The majority of participants from both groups shared the characteristic of a moderate, intentional and controlled use of digital technology. Their approach to online time was similar to what is known as digital minimalism (Newport, 2019). This finding was more important for Australian participants than for American participants who were somewhat more connected and had a stronger relationship to digital nature. Nature exposure, and connectedness to nature, have positive effects on human wellbeing and health from physical, mental and emotional perspectives. Consequently, nature exposure may also positively impact digital-human relationships, resulting in healthy and balanced digital consumption and habits.

9.3.2.2. Digital solastalgia and the effects of digital technology on the human-nature relationship

Research on the impact of digital technology on the human-nature relationship is still in its infancy. The present study has contributed to this growing field through the concept of digital solastalgia (i.e. the distress felt when learning about global ecological problems online). Digital nature (i.e. the experience of nature online), just like real nature, reflects the current ecological crisis. Participants can intentionally use the Internet to search positive experiences of nature (such as documentaries, inspiring pictures, articles promoting human nature, etc.), yet the majority reported experiencing digital solastalgia when checking the news, social media, etc. This study's findings emphasise the importance of a conscious, deliberate and moderate use of the Internet to nourish – instead of diminish – the human-nature bond. Digital technology and the Internet are wonderful tools to experience nature online, learn more about it and to promote real-life experiences of nature. The American participants who were more connected and had less access to physical nature than Australian participants reported the more intense digital solastalgia and the less ability to avoid it. In this respect, the Australian findings serve as a warning toward overly urbanised and digitalised environments. Were Australia going to follow the same path as the United States, which one may hypothesise it will in the context of a progress-orientated capitalist system, it will result in more human-nature disconnection. The human reaction that digital solastalgia represents is an important mind-body feedback indicating that humans are intrinsically part of nature and not separate from it. Ultimately, the

digital environment still being so new, it is the responsibility of each individual to use digital technology in a healthy way.

9.3.2.3. Online pro-environmentalism and digital exclusion

A problem in wider digital technology discourses is that of digital exclusion. Different terms are used interchangeably such as digital inclusion, digital participation, digital capability, digital literacy (Arts, Van der Wal and Adams, 2015). Digital exclusion is where a section of the population has continuing unequal access and capacity to use Information and Communications Technologies (ICT) that are essential to fully participate in society (Van Dijk, 2005; Warren, 2007). Traditional literature on the digital divide have focused on the binary of who uses the Internet and who does not (Gibbs, 2001; Helsper and Van Deursen, 2015; Norris, 2001). Participants to this study were also environmental advocates or environmental activists and used digital technology as a tool to spread their message. Yet, their activism did not stop online and reflected their real life. Community gardeners, ecovillagers, professional activists were activists in the virtual and the physical spheres. However, as many of them would live in natural, semi-rural or remote (ecovillages) areas, Internet access was not always easy and digital exclusion could be an issue. Recent studies (Hargittai 2002, Livingstone and Helsper, 2007) equate digital exclusion with second-order divides including autonomy of Internet use, social support networks, use patterns and skill levels. Accordingly, some participants (some from older generations and some millennials expressing a lack of interest in technology) would have less digital skills and knowledge. The term *digital divide* also has limits as a metaphor. A divide presents the image of two groups of people divided by either a gap or a barrier. Whereas in reality the same person can move between states of access and exclusion depending on changes in circumstances. As Hope, Martin and Zubairi (2016) point out, digital exclusion in a culture where hyperconnectivity is the norm means social exclusion. According to the authors, the relationship between digital and social exclusion remains poorly understood. Digital participation can help to mitigate social exclusion by introducing disadvantaged groups access to the benefits of Internet use. However as long as social inequalities remain offline these will translate into inequalities online as those who are socially excluded are less likely to have access to the Internet and lack digital skills.

Arts, Van der Wal and Adams (2015) argue that how digital exclusion plays out in nature conservation communities is still poorly understood. Pro-environmental individuals share values around voluntary simplicity, simple living, and downshifting as a way of life that rejects the high-consumption, materialistic lifestyles of consumer cultures (Elgin, 1981; Nearing and Nearing, 1970; Schor, 1998). These values extend to every area of their life including their digital habits. Many participants to the study voluntarily excluded themselves from the Internet when on digital detox or by implementing digital minimalism on a daily basis.

They illustrate a growing, yet minor, trend in contemporary Western culture where people intentionally limit their use of digital technology and restrict their digital consumption. Digital exclusion as a form of social exclusion (Hope, Martin and Zubairi, 2016) is described as unintentional but this is different in the context of conservation activism in this study. Digital exclusion could have been a limitation to this study by focusing on individuals who were only available online. But pro-environmental individuals, when not connected, are not so much digitally excluded as they do not want to be found online.

Participants to this study were selected on the basis of being digital users, and the netnographic dimension of the methodology excluded people with no Internet access. The NHS Digital (2021) explains that some sections of the population are more likely to be digitally excluded than others. These include older people, people in lower income groups, people with fewer educational qualifications or people living in rural areas. It is interesting to note that in the case of this study, participants from all age categories and all incomes were represented as digital users. Living in rural or remote areas, which was the case for ecovillagers, if not always practical, was not considered an obstacle to using digital technology, and these communities made a point of relying on technology to stay connected with the outside world, to enhance their experience of nature and to share online. Contemporary pro-environmental individuals and communities, for the connection they represent between nature and technology, show that digital inclusion is possible in rural areas.

9.4. Future research

This study showed the relations between nature, humans and digital technology in pro-environmental communities in Australia and the United States. A deeper understanding of key Western concepts such as nature, culture, the human/nature dualism, and environmental identity was necessary to illustrate how participants related to natural environments. The human-nature connection has several dimensions, and humans connect to nature on intellectual, physical and emotional levels. Dealing with such constructs as the human/nature dualism and other Western dualisms (i.e. mind/body, intellect/emotion, male/female, individual/universal, etc.) related to an intellectual connection, and an intellectual understanding of nature. Future research would aim to analyse the depths of a more sensuous connection to nature and to explore ecotherapy practices. A holistic relationship with nature encompasses both nature's ability to nurture us, through our contact with natural spaces, and our ability to reciprocate this healing connection through our ability to nurture nature. Ecotherapy is positioned as healing the human-nature relationship and includes a range of therapeutic and reconnection practices such as horticultural therapy, green exercise, animal-assisted

therapy, wilderness therapy, natural lifestyle therapy, eco-dreamwork, community ecotherapy and dealing with eco-anxiety and eco-grief with others (Buzzell and Chalquist, 2009).

The impact of digital technology on the human-nature bond, as well as the impact of nature on digital habits could also lead to future research on the subject. The aim would be to understand how nature could help digital-related problems such as digital addiction and digital anxiety which are growing concerns for younger generations. As Kahn (2002) explains with his theory on environmental generational amnesia, each generation perceives the environment into which it is born, no matter how developed, urbanised or polluted, as the norm. So, what each generation comes to think of as 'nature' is relative, based on what it is exposed to. This means that children's experiences of nature in a digital context are at risk of being more and more superficial and limited. It would be essential for research to develop practices and protocols aimed at integrating nature exposure and ecotherapy practices for digital users. The present study's findings show the importance of childhood nature experience in forming pro-environmental values that will last in adulthood. Contact with nature affects children's physical and mental development, and a weakened childhood experience of nature in modern society has educational and political consequences. Pursuing more digital nature will tend to alienate individuals from real nature, accepting a digital substitute for engagement with nature. The potential experience of digital solastalgia resulting from online time also stresses the need for real nature. This finding should alert both national and local governments aiming for more sustainable practices, policies, and societies. It should encourage them to facilitate people to experience nature, both frequently and intensively, and to keep nature easily accessible, particularly in cities.

The goals of such future research would be to contribute to conservation policy and practice, and to enhance reflexivity vis-à-vis the policy-making process. Environmental policies would benefit behavioural change to improve environmental management outcomes. Reflecting on the worldview that undergird one's aims, the way one attempts to realise those aims through policies and practices, as well as one's evaluation of their outcomes, may have a powerful and transformative effect on the policy-making process. Policies across the environmental sector are increasingly focusing on behavioural change as a means to improve environmental performance (Chen, Xu and Frey, 2016; Jakovcevic and Steg, 2013). Behavioural change is directly linked to one's perception of the world, and environmental worldviews are positively correlated with pro-environmental behaviours. Urbanisation, screen dependency, and the changing nature of childhood have led to increased time indoors, creating physical and emotional distancing from nature. Studies (Deville et al., 2021; Keniger, Gaston, Irvine and Fuller, 2013) indicate that overall time spent in nature leads to increased perceived value for connectedness to nature and, subsequently, greater pro-environmental attitudes and behaviours. Participants to the present study are examples of this. Their innovative ways of living, balancing effectively digital and natural environments, articulate powerful ideas that anyone developing sustainability policies or practices may be able to learn from. Most participants tended to argue

for a positive approach towards sustainability and conservation issues in a digital context. They focused on inspiring and improving society, and leading by example. They stayed away from fearful, pessimistic discourses and doom scenarios which prevail in the media. This appears to be in line with recent insights about how to effectively communicate climate change. As many authors (Futerra, 2005; Moser, 2007; Moser and Dilling, 2007) claim that a ‘vision of a future worth fighting for’ is the great absentee in current climate communications.

9.5. Conclusion

This study aimed to understand the relations and dynamics between nature, culture and digital technology, and how they shape human-nature relationships and human identity in regard to nature. As a study comparing pro-environmental individuals in the United States and in Australia, it resorted to a cross-cultural mixed methods design to help define common trends between groups of participants and to identify differences within similar cultures. In a globalised environmental culture, nature, culture and digital technology were mostly perceived in similar ways in both countries, with some differences. The human/nature dualism (i.e. the conceptual separation between human beings and nature inherent to Western culture) was represented in the participants’ answers, just as the humanature continuum was. I interpreted this diversity of views as the expression of an evolution in the way the Western mind defines nature and relates to nature. Based on the abundance of studies on the relation between human, nature and self-identity – notably via the concepts of environmental identity and extended self (Belk, 1988; Clayton, 2003; McKinnell, 2011) – human identity was also an essential part of the equation (see point 9.3, figure 30). I would like to finish this thesis with the quotation by Oelschlaeger (1991, p. 350) that inspired me to start this PhD. “Do we dare think that we are nature watching nature?... For, if nature is simply a fabrication of the knowing mind, then we are just watching ourselves”. If nature is a mirror of who we are, a reflection of ourselves, the human-nature relationship in contemporary Western capitalist society and the way it is evolving, echoes our own evolution. It is an evolution in identity. As human beings, we have long perceived ourselves as separate individuals and entities. We are now seeing the interconnection of all living things and questioning whether we may be more than just ourselves.

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Appendix A: Online survey



Living Nature in the Digital Age

My name is Melusine Martin and I am doing this research as part of my PhD in Society and Culture at James Cook University and Paris-Sorbonne Université. With the advent of the Internet, we are spending more and more time inside on screens and less and less time outside in nature. I am investigating how people are trying to reconnect to nature in a digital context.

Doing this survey is voluntary and you can stop at any time without explanation. Your responses and any contact details you provide will remain strictly confidential. The results from the study will be stored securely on the James Cook University data hub, and used only for academic research, academic publications and conference presentations.

The survey should take about 14 minutes to complete. If you are interested in a follow-up interview, there is an option to leave your contact details at the end of the questionnaire. The follow-up interview is not compulsory, but for those who accept to do it, it will be a great way to go deeper into some of the concepts this survey introduces and it will be of great help for my research.

If you have any question, please contact me by email: melusine.martin@my.jcu.edu.au

Thank you for your time and support! And don't skip the last page of the survey as a surprise is waiting for you there.

- * 1. Please confirm that you consent to participate as a respondent (note that you will not be able to proceed with the survey if you do not tick the box.)

I understand that taking part in this study is voluntary and that I can stop my participation at any time without explanation or prejudice and can withdraw any unprocessed data I have provided as long as the information has not been submitted. I understand that any information I give will be strictly confidential and that no names will be used without my approval. I agree to the use of the research findings for research publications and conference presentations. I confirm that I am over 18 years of age and I acknowledge that once my information is submitted it will not be possible to withdraw the data.



Living Nature in the Digital Age

FIRST, SOME QUESTIONS ABOUT YOU.

2. What is your age?

18-23 years old

24-38 years old

39-49 years old

50-64 years old

65-74 years old

75 years old and over

3. What is your country of birth?

4. What is the postcode and/or city of your place of birth?

5. What is your gender?

Male

Female

Other

6. What is your current occupation?

7. What is the highest level of education you have completed?

8. Which of these best describes your average annual household income?

9. Where do you currently live (city/town and country)?

10. Was there a particular moment or event that made you change to a more environmentally friendly lifestyle?

Yes

No

Please specify:

11. If applicable, what year did you start sharing your experience about green lifestyle online (via socialmedia, blog, website, etc.)?

**NOW, SOME QUESTIONS ABOUT YOUR IDEAS ABOUT NATURE.**

12. According to the American Wilderness Act of 1962, wilderness is defined as “an area where the earth and its community of life are untrammelled by man, where man himself is a visitor who does not remain.” Do you agree or do you disagree with this definition?

Strongly agree

Disagree Strongly

Agree

disagree

Neither agree nor disagree

Can you explain why?

13. Please can you give your own definition of "nature"?

14. Has your upbringing helped you to nurture a relationship with nature?

Yes

No

Can you please explain how?

15. Solastalgia describes the distress people experience when a home and its landscapes are negatively impacted (by urban transformation, pollution, road works, tree cutting, etc.). It also describes a yearning for nature, common to Western societies, as screen time is winning over green time. Have you ever experienced solastalgia?

- | | |
|------------------------------------|----------------------------------|
| <input type="radio"/> A great deal | <input type="radio"/> A little |
| <input type="radio"/> A lot | <input type="radio"/> Not at all |
| <input type="radio"/> Moderately | <input type="radio"/> |

Can you describe your experience of solastalgia (in what context it happened, how you felt, etc.)?

16. Do you see yourself as being separate from nature or as being part of nature?

- | | |
|---|---|
| <input type="radio"/> Completely separate from nature | <input type="radio"/> Slightly part of nature |
| <input type="radio"/> Mostly separate from nature | <input type="radio"/> Mostly part of nature |
| <input type="radio"/> Slightly separate from nature | <input type="radio"/> Completely part of nature |

17. Do you consider humans' modern creations (e.g. plastic, electricity, cars, smartphones, etc.) as being part of nature?

- Yes
- No

Can you please explain?

18. How do you distinguish between *nature*, *wilderness*, and *bush*?

19. Ecofeminism is a movement that sees parallels between the oppression of nature and the oppression of women. These parallels include, but are not limited to, seeing women and nature as property, and acknowledging that men dominate women, and humans dominate nature. Do you see yourself as an ecofeminist?

Yes

No

20. Do you consider yourself...? *(Tick as many boxes as necessary)*

An ecologist

An activist

A feminist

An ecofeminist

None of the above

Other (please specify)

21. The human/nature dualism is a prevalent concept in Western society that describes human and nature as being separate and distinct. For instance, we often believe that city and nature are opposite, or that humans are superior to plants. Do you think there is any truth to the concept of human/nature dualism?

Yes

No

Whether you answered yes or no, can you please justify your answer?



22. In a typical day, how much time do you spend using the Internet?

- 1 hour or less
- 1-2 hours
- 2-5 hours
- 5-8 hours
- More than 8 hours

23. In a typical day, how often do you check your emails?

- Never
- Rarely
- Sometimes
- Often
- Constantly

24. In a typical day, how often do you check social media (e.g., Facebook, Twitter, Instagram, Snapchat, etc.)?

- Never Often
- Rarely Constantly
- Sometimes

25. Do you periodically unplug and deliberately take a *digital detox* (for example, no digital technology after 7pm, no connection at all on Sundays, etc.)?

- Yes No

If you answered no, is it something you would like to do?

And, if you answered yes, can you please describe your routine?

26. Do you experience feelings of powerlessness due to the increasing prevalence of digital technology in everyday life?



Y

e

s



N

o

27. Many researchers think that technology is changing our relationship with nature. In your experience, has digital technology helped you to have a deeper relationship with nature, or has it prevented you from having a deeper relationship with nature?



has

helped

me

It has

prevented

me



prevented me Can you please explain

your answer?



Living Nature in the Digital Age

YOU HAVE REACHED THE END OF THIS SURVEY.

28. I am inviting survey participants to take part in follow-up interviews (via Skype, over the phone, or via emailed questionnaire.) If you are willing to be interviewed, please enter your

contact details below.

Name

Email Address

Phone Number

29. Thank you for taking part in this survey, your contribution is very valuable to the research. As a token of my appreciation, I will be randomly selecting several participants for \$100 worth of iTunes and App Store vouchers. If you would like to be entered into the draw and win one of the vouchers, please enter your email below.

Email Address

Appendix B: Interview information sheet

RESEARCH PROJECT INFORMATION SHEET

“Living Nature: Western Thinking and the Experience of Nature in the United States and in Australia in the 21st Century”

You are invited to take part in a research project about how people perceive nature in the digital age. The study is being conducted by Melusine Martin and will contribute to a thesis for a PhD (College of Arts, Society and Education) at James Cook University and Paris-Sorbonne Université.

If you agree to be involved in the study, you will be invited to be interviewed. The interview should take between 45 minutes to one hour. It will be conducted at the Cairns Institute at James Cook University, or a venue of your choice. It may be done via Skype or by telephone if necessary. With your permission, the interview will be audio-recorded. You will need to complete and return an “Informed Consent Form” before the beginning of the interview.

Taking part in this study is completely voluntary. The project is a low risk research and will not result in any risks or distress for participants. You are free to stop your participation at any time without explanation or prejudice. And, in case you wish to withdraw after completing the interview, recordings will be erased and the information you provided will not be included in the study results.

Your responses and contact details will be strictly confidential. The data and any audio recordings from the study will be used for data analysis only. The results of the study will be used for academic purposes such as research publications and conference presentations. You will not be identified in any way in these publications unless you specifically agree to be.

If you know of other persons that might be interested in this project, please pass on this information sheet to them so they may contact the researcher to volunteer for the study.

If you have any questions about the study, please contact the researcher, Melusine Martin, or her supervisors, Dr Maxine Newlands and Dr Simon Foale.

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***If you have any concerns regarding the ethical conduct
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Phone: (07) 4781 5011 (ethics@jcu.edu.au)***

Appendix C: Interview informed consent form

This administrative form
has been removed

Appendix D: Interview questions

INTERVIEW QUESTIONS

1/ You define yourself as being part of nature. Please can you explain what it means to you to be part of nature? (How do you know you are part of nature? How do you experience it? Is it more of a thought, a feeling, both? Have you always felt that way or did it happen at the precise moment in your life? Etc.)

2/ The notion of home is an important element in the human/nature dualism and is best illustrated by the Western definition of wilderness, as wilderness is conceptualized as far away from human homes. When we say humans are separate from nature, what we are really saying is that nature is always the ‘outside’, the opposite of what we think as home. In your opinion, is there a way for Westerners to reconcile the notion of home with that of nature?

3/ One of the biggest paradoxes in the survey results is how the majority of respondents agree with the definition of wilderness as proposed by the American Wilderness Act (“humans are to be visitors who do not remain...”) and also define themselves as being mostly or completely part of nature. Your answers were coherent with these findings. If humans are nature, and wilderness is nature, why can’t humans live in wilderness (nature living in nature)? Do you think there is a paradox in the logic of your answers? And can you provide further details on why you think that way?

4/ If wilderness areas were to include Western inhabitants living there permanently but in a sustainable and eco-friendly way, would you still perceive these areas as wilderness? (Please justify your answer).

5/ Please comment on this quotation by Rolston: “The advice to follow nature is impossible. We could not do so if we tried, for in deliberately trying to do so we act unnaturally. If humankind is

part of nature, then human actions cannot be construed as anything other than natural even if detrimental to the larger natural community.”

6/ Some individuals in Western societies choose an eco-conscious lifestyle, yet the greater part of society still lives in ways harmful to nature. You describe yourself as being part of nature, do you perceive individuals living unsustainably as being part of nature as well? (Please justify your answer).

7/ Do you experience *digital solastalgia* (i.e. the distress felt when hearing about global ecological issues online - via social media, digital news, Youtube, etc.)? And how often do you experience it in comparison to *solastalgia* (i.e. the distress felt when seeing the nature close to your living area being negatively impacted)?

8/ While we cannot avoid seeing nature being destroyed around us, we are able to choose what we watch and read online. Do you consciously use the Internet to experience positive things about nature (i.e. watching inspiring documentaries, reading blogs promoting sustainability, etc.)? If so, what exactly do you like to read or watch?

9/ How do you feel physically after one hour or more of screen time (e.g., energized, relaxed, tired, drained, etc.)?

10/ The survey findings show that most people experience a positive connection to nature via the Internet. However, this happens on an intellectual level while people tend to physically experience it in a negative way (they feel strained, stressed and overly tired after screen time). Do you think digital-based natural experience (i.e. online documentaries, nature-related news, pictures, green activism...) eventually promote a disconnection between mind and body? Is this something that you have experienced?

Appendix E: Conversion of annual income categories for Australia and the United States

Table 9.

Conversion of annual income categories from US\$ to AU\$ [*currency exchange rates for 2019*]

US dollars	AU dollars
0 - 9,999	0 -14,790
10,000 - 19,999	14,791 - 29,581
20,000 - 29,999	29,582 - 44,372
30,000 - 39,999	44,374 - 59,163
40,000 - 49,999	59,165 - 73,955
50,000 - 59,999	73,956 - 88,746
60,000 - 69,999	88,747 - 103,537
70,000 - 79,999	103,538 - 118,329
80,000 - 89,999	118,330 - 133,120
90,000 - 99,999	133,121 - 147,911
100,000 - 149,999	147,912 - 221,868
150,000 - 199,999	221,869 - 295,824
200,000 or more	295,825 or more

Table 10.Conversion of annual income categories from AU\$ to US\$ [*currency exchange rates for 2019*]

AU dollars	US dollars
0 - 9,999	0 - 6,759
10,000 - 19,999	6,760 - 13,519
20,000 - 29,999	13,520 - 20,279
30,000 - 39,999	20,280 - 27,039
40,000 - 49,999	27,040 - 33,799
50,000 - 59,999	33,800 - 40,559
60,000 - 69,999	40,560 - 47,319
70,000 - 79,999	47,320 - 54,079
80,000 - 89,999	54,080 - 60,838
90,000 - 99,999	60,339 - 67,598
100,000 - 149,999	67,599 - 101,398
150,000 - 199,999	101,399 - 135,197
200,000 or more	135,198 or more

Appendix F: Conferences and publications

Conferences

Martin, M. (2019). Becoming nature in the digital age: The human-nature dilemma. Fourteenth International Conference on Interdisciplinary Social Sciences, Mexico City, Mexico.

Newlands, M. & Martin, M. (2018). Tweeting the reef revolution: An analysis of public debates on the Great Barrier Reef restoration. Reef Futures, Key Largo, Florida.

Martin, M. (2018). Vers une définition de la nature : Comprendre la connexion homme-nature à l'ère du digital. Conférence Sorbonne Actuelle, Paris, France.

Martin, M. (2018). The idea of nature in Western culture: Understanding the human-nature connection in the digital age. Fourteenth International Conference on Environmental, Cultural, Economic and Social Sustainability, Cairns, Australia.

Martin, M. (2018). Environmentalism and the machine: Questioning the human/nature dualism for a sustainable future. Tenth International Conference on Climate Change: Impacts and Responses, Berkeley, California.

Martin, M. (2018). Plug into nature: Wellness, nature and technology in the digital age. Eighth International Conference on Health, Wellness and Society, London, UK.

Martin, M. (2017). The wilderness effect: Healing the human-nature connection in the digital age. Intersecting Fields Conference, Townsville, Australia.

Martin, M. (2017). Urban foraging: Rethinking the human-nature connection in tropical cities. Tropics of the Imagination Conference, Singapore.

Martin, M. (2016). Raw nature/raw power: How climate change challenges women's ideas about nature. Ecofeminism, Educators and Climate Change Symposium, Cairns, Australia.

Publications

Martin, M. (2019, Feb. 22). La nature, un remède au mal urbain. *The Conversation*.

Martin, M. (2018, Sept. 3). Internet : Les bienfaits de la déconnexion. *The Conversation*.

Martin, M. (2018, May 10). Le besoin de nature à l'ère digitale, entre science et philosophie. *The Conversation*.

Martin, M. (2018). Urban foraging: Rethinking the human-nature connection in cities. *eTropic*,

17(1), 149-63.

The Conversation

La nature, un remède au mal urbain

22 février 2019

Des travaux en bas de chez moi m'ont réveillée ce matin. Le bruit des marteaux piqueurs, les éclairages de rue qui illuminent les murs de l'appartement, les voitures qui défilent, ou juste l'air qui, au lieu de sentir le vert, sent le gasoil. On s'y est habitué. Les odeurs, les rythmes et les sons de la ville sont devenus ma norme. De plus en plus d'auteurs évoquent le manque de nature dont souffre la société occidentale. Glenn Albrecht, ancien professeur à l'Université Murdoch, a créé le terme *solastalgie* pour évoquer la détresse que l'être humain éprouve face aux changements liés à son environnement naturel proche. Le journaliste américain Richard Louv, lui, parle même de *trouble de déficit de nature* dont les conséquences sur la santé vont du stress chronique à la dépression, en passant par les troubles du sommeil et l'hyperactivité. Alors que le mode de vie moderne pousse à plus d'heures face aux écrans, passer du temps au grand air est devenu optionnel. Mais pour l'animal humain que nous sommes, ce nouvel état des choses peut perturber jusqu'à notre sens d'appartenance. Albrecht parle de cette impression d'avoir le mal du pays alors même qu'on est à la maison. Peut-être parce que l'on s'est trompé de « maison ». Parce qu'on a besoin de nature. Si favoriser du temps dans la nature est salvateur, quelles en sont les vertus admises par la science, et comment peut-on ramener du sauvage dans un quotidien urbanisé ?

Les vertus de la nature

De plus en plus d'études sont menées afin de comprendre les effets physiologiques et psychologiques de la nature sur le corps et le cerveau humain. Voici les idées les plus répandues :

- **La nature réduit le stress**

Selon une étude de l'Université du Michigan, passer du temps dans la nature est un remède efficace contre le stress. Des marches régulières dans la nature permettent d'abaisser le niveau

stress et de réduire les symptômes de dépression. Cela ralentit le rythme cardiaque et diminue la tension artérielle. De même, le simple fait de jardiner diminue le taux de cortisol dans le sang – l'hormone du stress – et améliore de l'humeur.

● **La nature renforce l'immunité**

Une étude de l'Université de l'Illinois a démontré un lien entre temps passé dans la nature et hausse de l'immunité. Cela résulte du fait que le corps, mis dans un milieu naturel, se met automatiquement en mode « repos/détente », l'opposé du mode « fuite/lutte » ; le système immunitaire, lié au système nerveux parasympathique, est alors mis sur pause. Une autre étude suggère que des « bains de forêt » (de l'expression japonaise *shinrin yoku*) augmentent le taux de globules blancs dans le sang jusqu'à 30 jours après exposition.

● **La nature rend créatif**

Des chercheurs de l'Université de l'Utah ont soumis un groupe de randonneurs à une série de tests avant et après une randonnée de quatre jours. Les résultats montrent une amélioration de 50 % des capacités créatives des participants après randonnée. De même, les enfants qui travaillent dans des salles de classe en plein air apprennent mieux et génèrent plus d'idées créatives.

● **La nature favorise le sommeil**

La vie moderne qui encourage lever tôt et coucher tardif, le tout à la lumière d'ampoules électriques et d'écrans digitaux, aurait retardé notre horloge biologique interne d'environ deux heures. Selon une étude de l'Université du Colorado, faire du camping pendant seulement deux jours permet de rééquilibrer les rythmes naturels de veille et de sommeil. S'exposer dès le matin à la lumière du soleil aide à éviter sautes d'humeur, insomnie et prise de poids.

Le dualisme homme/nature

On ne guérit pas de la ville lorsqu'on y est né. On la porte en soi. Je souhaitais lister les effets scientifiquement prouvés de la nature car c'est ce que l'esprit pensant aime entendre : la science reconforte, elle dit une « vérité ». On la croit avant même de l'avoir comprise. Mais il faut commencer par analyser ses croyances pour amorcer un changement réel. Le dualisme

homme/nature, concept important en sociologie environnementale, qui définit l'humain comme étant séparé de la nature, reste omniprésent dans la culture occidentale. L'avènement de la révolution industrielle, au XIX^e siècle, a radicalement changé la relation de l'homme à la nature. Là où la nature était auparavant directement expérimentée (travail aux champs, etc.), elle est devenue le résultat d'une intellectualisation sociale et culturelle avec l'urbanisation et les changements de mode de vie qui en découlent.

Le milieu urbain nous coupe-t-il de la nature ?

On finit par comprendre et observer la nature par l'entremise des médias, des livres, sur Internet, au cinéma, etc. On s'y attache sans se rendre compte que ce n'est qu'une idée qui ne prédomine pas dans le monde entier. Comme l'explique Descola dans *Par-delà nature et culture*, « la manière dont l'Occident moderne se représente la nature est la chose la moins bien partagée. » Le dualisme homme/nature est aussi aux fondements de la politique environnementale moderne. On ne chercherait pas à « sauver » la nature si l'on ne se pensait pas séparé d'elle. Autre. Retrouver la nature en ville, c'est abolir ces frontières.

Apprendre à redéfinir ce qu'est la nature, ce qu'elle n'est pas, c'est aussi apprendre à se redéfinir soi-même. Délaissons la croyance selon laquelle la nature, pour être vraie, doit être sauvage et absente de toute trace de vie humaine. La nature est tout autour de nous, tout le temps, qu'il s'agisse d'un parc en banlieue, du jardin de sa maison, de la colline derrière chez soi, des arbres le long d'une avenue, de la plage, de la Seine à Paris, du ciel. Si le terme *nature* implique un endroit où le vert l'emporte sur le béton, il est aussi important d'apprendre à porter notre attention sur ces petits bouts de nature que la ville inclut et de ne pas oublier que sous le goudron, il y a la terre. Alors comment faire pour ramener un peu de nature dans un quotidien urbanisé ?

Intégrer la nature à un quotidien urbanisé

Voici quelques façons simples et accessibles de réintégrer la nature en ville.

- **Passer 30 minutes par jour dans la nature.** Lire dans un parc, marcher sur la plage ou flâner le long des quais sont autant de doses de nature en ville qu'il est aisé d'intégrer à sa routine quotidienne.

- **Mettre des plantes vertes chez soi.** En plus d'assainir l'air, elles ont un effet apaisant. Une étude réalisée par la NASA a testé un grand nombre de plantes et montré lesquelles étaient les plus purifiantes pour les environnements pollués.

- **Jardiner.** Si vous avez un jardin, tant mieux. Si vous vivez en appartement, cultivez en pots sur votre balcon ou rebords de fenêtre. Même un bocal de graines germées sur le comptoir de la cuisine constitue un mini jardin en soi.

- **Favoriser les matériaux naturels chez soi.** Terre cuite, bois et lin, des matières naturelles dans la maison. Essayez le bois et la terre cuite pour les ustensiles de vaisselle et de cuisine, les draps de lit en lin naturel ou en coton bio. Optez pour des contenants en verre plutôt qu'en plastique pour stocker la nourriture (vous pouvez en profiter pour recycler vos bocaux usagés qui font des tupperwares sains et gratuits).

- **Se reconnecter à la nature par l'alimentation.** Faites le plein de fibres et de vitamines en faisant la part belle au végétal dans vos repas. Allez régulièrement au marché et tentez la cueillette en milieu urbain si l'endroit s'y prête. Les cosmétiques et produits de soin ne sont pas à négliger non plus. Inspirez-vous du principe de beauté ayurvédique qui veut que l'on ne mette rien sur la peau que l'on ne mettrait dans la bouche.

- **Composter ses déchets organiques** Épluchures, pelures, fanes, pain rassis et restes de nourriture, ces matières organiques que vous jetez à la poubelle ne se décomposeront pas en décharge et seront même source de pollution. Votre ville propose certainement des composteurs collectifs, sinon pourquoi ne pas essayer le lombricompostage qui se prête très bien à la vie en appartement ?

Si en naissant dans un pays industrialisé, j'ai, sans le vouloir, pris part à l'écocide, que le raffinement de mon héritage culturel et la dimension sauvage de mon appartenance au monde animal se font la guerre, et que je m'exaspère à chaque fois que s'enclenche le vomissement d'un souffleur de feuilles, c'est doucement que je renégocie le quotidien. Un pas après l'autre, je redécore en vert ce que l'on m'a donné en gris. On peut choisir de fuir la ville. On peut aussi choisir de la changer.

The Conversation

Internet : Les bienfaits de la déconnexion

2 septembre 2018

Mes yeux s'ouvrent et contemplant les palmiers sur fond bleu qui miroitent sous l'éblouissant soleil australien. C'est une belle journée qui commence tranquillement. Machinalement, je cherche mon smartphone des mains sur la table de nuit pour consulter mes messages en attente. Je ne suis pas encore levée que déjà le monde me demande. Je sens une tension diffuse se propager dans ma poitrine, descendre le long de mes bras, et atteindre le bout de mes doigts qui pianotent sur l'écran digital. En une fraction de seconde, la journée est passée au rythme numérique. J'ai quitté le présent pour un monde virtuel. C'est un fait, nous passons de plus en plus de temps sur Internet. Parallèlement à cela, un nombre croissant de personnes cherchent à s'en déconnecter. Tout en appréciant les avantages des technologies numériques, elles souhaitent établir des limites afin de ne pas être joignables en permanence. Mais pourquoi vouloir se déconnecter d'Internet ? La communauté scientifique avance trois raisons majeures : passer du temps en ligne diminue notre productivité, cela est addictif, et cela nuit à la santé.

Passer du temps en ligne affecte notre productivité

Je dois écrire un article scientifique suite à une conférence sur le réchauffement climatique. Il est temps que je m'y mette. Je m'installe à mon ordinateur. Document Word créé. Études scientifiques sélectionnées. Pile de livres à ma droite. Tisane d'ortie à ma gauche. J'ai une heure devant moi pour travailler sur cet article. Fatalement, je suis connectée à Internet pour vérifier mes sources et peaufiner mon argumentaire. Fatalement, je reçois un ou cinq e-mails auxquels je ne réponds pas mais qui me déconcentrent. Mon téléphone vibre, mon ordinateur affiche des notifications, ma tablette m'envoie des annonces. Afin de gérer ce pic inattendu de cortisol, je tente de me calmer en regardant des photos sur Instagram, une vidéo sur YouTube et quelques posts sur un blog. Au final, j'ai perdu 20 minutes. Ce scénario vous paraît familier ? Selon une étude menée par Microsoft, la capacité de concentration de l'homme est passée de 12 à 8 secondes en dix ans. La cause ? L'omniprésence des écrans. Une étude de l'université de Californie à Irvine montre que travailler en étant constamment interrompu augmente le niveau de stress, car on a

tendance à travailler plus vite pour rattraper le temps perdu. Aujourd'hui, une personne sur quatre vérifie son smartphone toutes les 30 minutes et 25 % des Millennials le consultent plus de cent fois par jour. Des comportements qui affectent notre productivité et augmentent notre niveau de stress.

Internet est addictif

FOMO (*fear of missing out*), « digital detox », ou « slow technology » sont des expressions que vous avez déjà peut-être entendues. La société post-industrielle est en train de réagencer ses fondations autour du digital. On l'utilise partout, tout le temps, pour travailler, contacter ses proches, faire les courses, gérer son compte bancaire, préparer les prochaines vacances ou s'occuper des devoirs des enfants. Ce qui était initialement conçu comme un outil est en train de devenir une obsession. Est-ce que vous perdez la notion du temps quand vous surfez le Web ? Vous ne pouvez pas vous empêcher de regarder votre smartphone lorsqu'il vibre ? Vous paniquez si vous oubliez votre téléphone à la maison ? Vous êtes peut-être accro au digital. Des études menées aux États-Unis et en Europe rapportent que 38 % de la population globale souffre de trouble de dépendance à Internet (TDI), également nommé cyberaddiction. L'une des causes avancées pour expliquer cette addiction est une altération physique du cerveau au niveau structurel. En effet, l'usage d'Internet affecte certaines parties du cerveau préfrontal associées au souvenir de détails, à la capacité à planifier et à hiérarchiser les tâches, nous rendant ainsi incapables d'établir des priorités dans notre vie. En conséquence, passer du temps en ligne devient prioritaire, et les tâches de la vie quotidienne passent après.

Internet nuit à la santé

Une des questions que je pose fréquemment aux participants d'une étude réalisée pour ma thèse sur les relations de l'homme à la nature à l'ère digitale est « Comment vous sentez-vous après une heure et plus passées devant un écran ? » J'attends encore de rencontrer la personne qui me répondra qu'elle se sent mieux. Les réponses oscillent généralement entre « fatigué » et « vidé ». Des études prouvent qu'il existe une forte corrélation entre dépression et temps connecté. Sur Internet, on cherche à établir une relation à l'autre, une relation au monde. On se connecte aux autres, mais on se connecte mal. Le Dr Hilarie Cash pense que l'élément manquant est la résonance limbique qui ne peut se reproduire que lorsque deux êtres sont en présence physique l'un de l'autre.

La résonance limbique est un échange énergétique qui libère, dans la partie limbique du cerveau, des composants chimiques essentiels au bien-être physique et émotionnel. Selon Cash, plus nous passons de temps en ligne afin de nous connecter aux autres, plus nous déprimons. Peut-être est-il temps de revoir nos priorités et de cesser d'abdiquer notre pouvoir à ce rectangle de polymère qu'est notre smartphone ?

Adoptez la *slow technology* !

Maintenant, quand je me sens débordée par les sollicitations constantes et imprévisibles de ma connexion wifi, juste avant d'étouffer, je débranche. Le mouvement en faveur de la *slow technology* répond précisément au besoin d'une approche raisonnée de notre consommation digitale. De plus en plus de professionnels proposent des retraites de digital detox où l'on prend le vert et laisse son portable éteint. Il est possible de mettre en place, dès à présent, quelques trucs et astuces pour rétablir un équilibre dans votre relation au numérique, et aussi retrouver un bien-être physique et mental.

Voici quelques solutions *slow tech* faciles à adopter :

- **Ressortez votre vieux réveil à pile.** Arrêtez d'utiliser votre portable comme réveil, et pensez à le laisser hors de votre chambre à coucher.
- **Mettez en place un jeûne digital alterné.** Il s'agit de prendre conscience du temps que l'on passe scotché à son écran et de le diminuer. Plus de smartphone ni d'ordinateur après 19h, ou déconnexion complète un jour par semaine (par exemple le dimanche). Par exemple, vous pouvez vérifier vos e-mails le samedi soir avant 19h et plus rien jusqu'au dimanche soir, 19h.
- **Bougez.** Le temps passé devant un écran est généralement du temps passé immobile. Faites le choix d'aller à l'encontre de cette tendance statique et offrez à votre corps et votre esprit les bienfaits antidépresseurs de l'activité physique.
- **Passez du temps dans la nature.** De nombreuses études montrent que la nature a un effet calmant sur le système nerveux, renforce le système immunitaire, fait baisser la tension artérielle et booste même la capacité visuelle mise à rude épreuve par trop de temps à fixer un écran.

- **Trouvez du soutien** dans cette démarche qui va à contre-courant de la tendance générale de surconsommation et de surconnection. Non, vous n'êtes pas seul. Oui, il existe d'autres manières de vivre. Vous pouvez prendre part à des activités de groupe vous permettant de vous recentrer sur vos sens et votre ressenti. Par exemple, apprendre à jouer d'un instrument de musique, à sculpter le bois, à jardiner – même si vous habitez en ville, etc.
- J'ai toujours en bouche le goût d'éternité, l'impression de lenteur, qui teintaient d'un ennui apaisant les jours de ma vie pré-Internet. Je n'oublie pas que l'on peut vivre sans Internet même si le monde nous impose aujourd'hui de vivre avec. Je m'inquiète de voir des enfants de trois ans savoir se servir d'une tablette avant même de savoir écrire ; des enfants qui, parce que l'humanité est muée par des forces qui la dépassent et la modèlent sur la voie du progrès, ne connaîtront pas de vie sans Internet. Parce que l'on ne revient pas arrière. Et vous, qu'en pensez-vous ? Comment gérez-vous votre relation au numérique ? Laissez un commentaire ci-dessous et poursuivons cette conversation.

The Conversation

[Le besoin de nature à l'ère digitale, entre science et philosophie](#)

10 mai 2018

Les plus grandes révolutions se font dans le silence. Lentement, sans que l'on s'en aperçoive, elles transforment, un à un, tous les éléments de notre quotidien jusqu'au jour où, levant les yeux sur notre existence, on se rend compte qu'on ne la reconnaît plus. Internet est entré dans ma vie en 1999. Mes parents venaient d'investir dans un ordinateur, et là, sur cet écran digital, innovation née de l'esprit et de la main de l'homme, se laissait deviner un nouveau monde de possibles. Sur le coup, j'avoue ne pas y avoir compris grand-chose, ma perplexité n'ayant d'égal que mon désintérêt. Je n'avais pas réalisé que le monde tel que je le connaissais venait de changer à tout jamais, ni que ma relation à la nature allait prendre une nouvelle dimension. Alors que plus de la moitié de la population mondiale vit à présent en ville, dans des environnements où la technologie numérique prédomine, la relation de l'homme à la nature dans les sociétés post- industrielles est au mieux compliquée, au pire inexistante. On voit souvent la nature au travers du prisme de notre culture. On l'aime plus ainsi. Elle semble moins menaçante. À l'ère de la révolution digitale, où nous passons de plus en plus d'heures devant nos écrans de téléphone, d'ordinateur ou de tablette, se reconnecter à la nature semble être une solution au chaos moderne.

La nature comme remède : hier et aujourd'hui

La notion de nature comme remède aux maux de la civilisation n'est pas nouvelle. Les exemples de retour à la nature en réaction à un contexte urbain et/ou industrialisé abondent, depuis l'Antiquité jusqu'aux expériences actuelles de fermes urbaines et d'écovillages, en passant par le mouvement transcendentaliste et la période contre-culturelle. Au XIXe siècle, Henry David Thoreau expliquait, dans *Walden ou la Vie dans les bois*, sa décision de vivre dans une cabane dans la forêt, à l'écart de la société :

« Je m'en allais dans les bois car je souhaitais vivre sans hâte, ne faire face qu'aux faits essentiels de la vie, et voir si je pouvais apprendre ce qu'elle avait à m'enseigner, et ne pas avoir à découvrir, au moment de ma mort, que je n'avais pas vécu. »

Au XXe siècle, Helen et Scott Nearing, figures emblématiques du mouvement de « retour à la terre » (*back to the land*) qui toucha les États-Unis dans les années 1960, décidèrent de quitter des emplois stables à New York pour vivre de manière autosuffisante dans une ferme du Vermont. Aujourd'hui, au XXIe siècle, c'est par le biais de la science que nous redéfinissons notre relation à la nature. De plus en plus de chercheurs démontrent que la santé humaine est intrinsèquement liée à la nature, et même que les bienfaits éprouvés

sont proportionnels au temps passé dehors. Ils confirment aujourd'hui ce que l'homme avait toujours ressenti de manière instinctive : passer du temps dans la nature nous est vital. J'ai grandi en ville, ou plutôt entre ville et nature, puisque toute ville possède toujours un peu de nature, par les arbres qui bordent ses avenues, les parcs disséminés ici et là. Lorsque Internet est arrivé, lentement mais sûrement, les heures de mon quotidien sont devenues des heures passées à travailler devant un écran. Le besoin de nature s'est fait plus intense, la parenthèse verte après des heures d'ordinateur plus salvatrice, une bouffée d'oxygène vitale mais limitée. Alors que l'usage des technologies numériques favorise l'anxiété, la dépression et les troubles de l'attention, de nombreuses études scientifiques prouvent qu'au contraire passer du temps dans la nature restaure nos capacités cognitives et diminue notre stress. David Strayer, chercheur à l'université d'Utah, explique que le cortex préfrontal, le centre de commandement du cerveau, sur-sollicité par l'usage d'Internet et des réseaux sociaux, est en état d'alerte quasi permanent. Cependant il se met au repos quand l'être humain est dans un environnement naturel, entraînant une diminution des ondes cérébrales Thêta, et favorisant la créativité, la connexion émotionnelle et même l'intuition.

Nos idées sur la nature : le dualisme homme/nature

Les effets de la nature sur le cerveau humain sont peut-être clairs, mais nos idées et croyances à son sujet, elles, continuent d'évoluer. Dans le cadre de ma cotutelle avec une université australienne, je suis amenée à étudier la manière dont les populations aborigènes perçoivent la nature. Leur culture n'établit pas de ligne de démarcation nette entre les notions d'environnement naturel et de foyer (maison). Le dualisme homme/nature, aussi appelé dualisme nature/culture, qui se traduit par la séparation que nous créons presque constamment, et souvent inconsciemment, entre soi et la nature est un produit du système de croyances occidentales. Car, lorsque nous pensons à ce qu'est la nature, de quelle nature parlons-nous ? D'une nature idéalisée sur laquelle nous apposons le filtre de croyances romantiques ? Ou d'une nature perçue par les sens sans le jugement de l'intellect ? William Cronon, dans son essai « Going Back to the Wrong Nature », dénonce la perception erronée que la société occidentale se fait de la nature. Érigée comme une antithèse de la civilisation, la nature devient un espace sauvage et pur vers lequel l'homme, fuyant la société, se tourne pour se ressourcer, trouver du repos et se reconnecter à soi. C'est une nature qui commence là où la ville s'arrête, une nature qui nous est étrangère et au sein de laquelle nous ne sommes que de passage, une nature qu'il nous faut quitter pour retourner à la maison. Cette conception de la nature exacerbe la séparation entre l'homme et son environnement. Comme l'explique Cronon :

« Si nous nous permettons de croire que la nature, afin d'être vraie, doit également être sauvage, alors, notre présence même en son sein représente sa chute. L'endroit où nous sommes est l'endroit où la nature n'est pas. »

Pensez-vous réellement en tant qu'être humain faire partie de la nature ? De nombreuses personnes répondraient oui. Maintenant, pensez-vous que la ville dans laquelle vous vivez soit partie intégrante de la nature, qu'il n'y ait aucune différence entre cette ville et la nature ? Peut-être plus difficile à concevoir. Vous avez peut-être conscience que la ville que vous habitez a été construite sur un environnement naturel, qui perdure sous l'asphalte des routes et des rues, que tout ce qui constitue cette ville, votre logement y compris, provient de matériaux et composants naturels, que, de même que le béton n'est qu'un assemblage de matériaux d'origine minérale (sable, chaux, argile...), le plastique, lui, est issu de matières premières telles que le pétrole, le gaz naturel et le charbon ? Et pourtant, il nous est difficile d'accepter que la ville et la nature puissent ne faire qu'un, que la ville puisse être une extension de la nature, de même que la nature fait partie de la ville. Il nous est difficile d'accepter que notre foyer soit avant tout cet environnement naturel au sein duquel nos maisons sont construites.

Le trouble de déficience en nature : un mal moderne ?

Le professeur australien Glenn Albrecht dénonce la détresse chronique que l'être humain éprouve face aux transformations que les paysages naturels ont subies depuis la révolution industrielle. Il a créé le terme *Solastalgie* pour décrire cette sensation que quelque chose ne va pas, cette impression de ne pas être à notre place, ou, comme il le dit lui-même, cette impression d'avoir le mal du pays alors même que nous sommes à la maison. Du latin *solacium* (soulagement, apaisement) et *algia* (douleur, souffrance), ce néologisme évoque notre besoin viscéral de quiétude (qui ne semble pas trouver d'excipient dans un milieu urbanisé), ainsi que le lien que nous avons perdu avec la nature. Le journaliste américain Richard Louv, lui, parle de « trouble de déficience en nature » (*nature-deficit disorder*), et dénonce la tendance croissante des jeunes générations à passer plus de temps enfermées devant des écrans, que dehors à découvrir leur environnement naturel. Alors que la consommation d'anxiolytiques, de somnifères et d'antidépresseurs ne cesse d'augmenter pour palier à l'anxiété et au stress quotidiens, il se pourrait bien que le mal moderne soit un manque de nature. Alors que mes recherches de thèse me poussent à remettre en question les croyances fondamentales concernant la nature et notre identité en relation à elle, l'avancée de mon travail ne me permet pas encore d'apporter de réponses claires à ce sujet. Cependant, prendre du temps pour aller marcher en forêt, se baigner dans la mer, ou simplement lire un livre dans un parc sont autant de moyens de renouer avec la nature. Des chercheurs japonais ont démontré que marcher régulièrement dans la forêt, (ce qu'ils appellent prendre un bain de forêt ou *Shinrin-yoku*), entraîne une diminution du niveau de cortisol dans le sang, une baisse de la tension artérielle et active le système nerveux parasympathique, induisant une réponse de relaxation. Le monde actuel rend inévitable l'usage des technologies numériques et d'Internet, et comme

il n'est pas question de revenir en arrière, il est essentiel de trouver un équilibre dans l'emploi que nous en faisons. Redécouvrir et nourrir notre lien à la nature semble être un bon point de départ.

Urban Foraging: Rethinking the Human-Nature Connection in Cities

Melusine Martin

In the developed world, people talk and shop, numb to the ground that nurtures them. (Salleh, 1997, p. 176)

Abstract

This article examines foraging in urban areas – more specifically in Australia and tropical North Queensland - as an alternative mode of consumption for city residents. I explore urban foraging (the practice of gathering Indigenous and introduced edible plants from streets, parks, railway reserves, etc.) within a context of human/nature dualism which defines humans and nature as opposite. Urban foraging, which takes its roots in Indigenous Australian foraging tradition, is becoming more popular today as individuals seek connection with their food sources. Underlying this trend is a critique of industrial agriculture and the Western way of eating, as well as a need for a more sustainable system. The industrial system obscures the origins of the foods it produces by processing them so they appear as products of culture rather than nature. The urban foraging system, through gathering wild foods, is an attempt to reconnect with nature in the middle of the city. I argue that taking responsibility for the food we eat via urban foraging and cooking is a way to connect to nature through food. The paper calls on individuals to rethink human-nature disconnectedness by digging deeper to the problem's cultural roots, and how urban foraging begins to undermine a binary human/nature dualism philosophical imaginary.

Keywords

Urban foraging; Human/nature dualism; Environmental sustainability; Western diet; Wilderness; Solastalgia

We are living in an age where nature and wilderness are defined through the terms of

ecology, biodiversity, environmental ethics, climate change, recycling, renewables, and global warming. Environmentalism in the 21st Century is about a concept, the received wilderness idea, the notion of wilderness inherited from our forebears (Oelschlaeger, 1991; Plumwood, 2002). In 1964, wilderness was legally defined in the American Wilderness Act as follows:

A wilderness, in contrast with those areas where man and his own works dominate the landscape, is hereby recognized as an area where the earth and its community of life are untrammelled by man, where man himself is a visitor who does not remain. (wilderness.nps.gov)

The notion of unspoilt nature gained popularity in North America in the mid- to late 19th century (Thoreau, 1854; Muir, 1911). The 1960s were a defining decade for the literature on nature and wilderness. In 1962, Murray Bookchin warned about the dangers of pesticides in *Our Synthetic Environment*. That same year, *Silent Spring*, by Rachel Carson, documented the detrimental effects of synthetic pesticides for agricultural uses. And in 1968, Paul R. Ehrlich advocated immediate action to limit population growth in *The Population Bomb*. These books mark the beginning of a contemporary environmental movement in the United States that would go on to influence a global environmental movement. In Australia, the environmental movement was the first in the world to become a political movement. Australia was home to the world's first Green party – the United Tasmanian Group (1972). The Australian environmental movement, influenced by the American environmental movement and its literature, later developed its own literature with authors such as Bob Brown in *Wild Rivers*, 1983, and Tim Flannery in *The Future Eaters*, 1994. Today, environmental sustainability is not merely about being a good citizen and recycling; it is ultimately about maintaining an intimate relationship with nature. Research shows (Milton, 2002) that in order to truly care about 'being green,' one must actually have meaningful exposure to nature. But just as nature can affect human emotions, it can affect human health. Indeed, in our contemporary age of science and technology, researchers study the medical aspects of nature and nature's effects on stress and mental outlook, as well as on physical health (Ulrich & Parsons, 1992; Hartig, Mang & Evans, 1991). Albrecht (2012) talks about 'solastalgia', and Louv (2005) coined the term nature-deficit disorder to express what has become a defining characteristic of urbanised societies: the fact that we do not spend enough time outside in nature. A lack of nature results in behavioural problems (stress, anxiety, depression) and can influence our physical, mental, and societal health (Kaplan, & Kaplan, 1989; Atchley, Strayer, & Atchley, 2012; Berman, Jonides, & Kaplan, 2008). Increasingly researchers try to provide us with various ways to help us reconnect with nature – from green exercise and the experiments conducted by Japanese scientists (Miyazaki, 2018; Park, Tsunetsugu, Kasetani, Kagawa, & Miyazaki, 2010) to the values of horticultural therapy and gardening (Soga, Gaston, & Yamaura, 2017). Urban foraging can be one of the actions that can be

taken to reconnect with nature in the middle of the city, and to promote environmental sustainability at an individual level as well. Urban foraging can then be seen as part of the answer to the ecological crisis and to the growing health concerns of the Western world.

Industrial agriculture and Western diet

Western societies in general - including city residents in North Queensland - rely for their food mostly on industrial agriculture and the food industry.¹ Industrial agriculture is heavily based on methods characterised by technologies designed to increase yield. This system is supported by ongoing innovation in agricultural machinery, farming practices, and genetic engineering. Industrial agriculture is prevalent in the Western world. Most of the meat, dairy, eggs, fruits and vegetables available in supermarkets today are produced by such farms. Likewise processed packaged food has become predominant in our diet. Food processing includes the methods and techniques used to transform raw natural ingredients into food for human consumption. Today the supermarket is the defining retail element of the food industry. Food buying has become increasingly removed from its production as we no longer grow our own food but rely on supermarkets to obtain it. All year long, and independently from seasonal changes, people can find in supermarkets thousands of products gathered in one location. Heavily processed foods which American journalist Michael Pollan (2010) calls 'edible foodlike substances' are the basis of the Western diet.

The Western diet is generally characterised by high intakes of red and processed meat, high-fat dairy products, eggs, refined grains, white potatoes, and high-sugar drinks, with minimal intakes of fruits, vegetables, fish, legumes and whole grains (Halton, Willett, Liu, Manson, Stampfer, & Hu, 2006). Acids, anticaking agents, bulking agents, food colouring, emulsifiers, thickeners, stabilizers, flavours, humectants, preservatives, and sweeteners are important components of this diet. This was brought about by fundamental lifestyle changes following the Industrial Revolution, which introduced new methods of food processing including refined sugars, refined grains and refined vegetable oils (Carrera-Bastos, Fontes-Villalba, O'Keefe, Lindeberg, & Cordain, 2011). Medical anthropologists have identified several major eras of human disease, starting with the Age of Pestilence and Famine, which largely ended with the Industrial Revolution, or the stage we are in now, the Age of Degenerative and Man-Made Diseases (Omran, 1971). The Australian Bureau of Statistics (2015) has estimated that approximately 93 percent of Australian adults (over 18 years) do not meet the recommended daily vegetable intake of 5 serves

1 Although some comments are general to the Western world, this article focuses on Australia and North Queensland. Indeed, Australia represents a unique example of Western civilization. By its geographical location, it is the largest country in Oceania and is influenced by the neighbouring Asian countries yet it has inherited Western culture and Western economy from its European origins. It also has an important Indigenous Aboriginal and Torres Strait Islander population. It is, in these respects, comparable to the United States (Cole & Symes, 2017; Huntington, 2011).

or 375 grams. Many studies have proven that low vegetable consumption is linked to increased risks of cardiovascular disease and cancer (Deloitte, 2016). Another way to see what effect an increase in meat consumption might have on disease rates is for researchers to study lapsed vegetarians. People who once ate vegetarian diets but then started to eat meat at least once a week experienced a 146 percent increase in odds of heart disease, a 152 percent increase in stroke, a 166 percent increase in diabetes, and a 231 percent increase in odds for weight gain. And during the twelve years after the transition from vegetarian to omnivore, meat-eating was associated with a 3.6 year decrease in life expectancy (Singh et al, 2014). The Standard American Diet (SAD) - maybe the best example of the Western way of eating - relies heavily on processed food, which many researchers agree is the real cause of many health problems, much more so than meat consumption. As Michael Greger (2016) explains, “In general, the dividing line between health-promoting and disease-promoting foods may be less plant- versus animal-sourced foods, and more whole foods versus most everything else” (p. 5). Some migration studies have compared disease rates within the same ethnic groups in their current location and in their homeland. For example, the Alzheimer’s rates among Japanese men living in the United States are significantly higher than those of Japanese men living in Japan. And the balance of evidence suggests that the difference lies in the American diet (White et al, 1996). According to David Gillespie (2015), “Even when there was an abundance of food, other animals seemed to stop eating well before the point they gained 50 percent of their body weight. The only exceptions to this rule appeared to be humans and any animal unfortunate enough to be fed by humans” (p. 2). Habits, or tradition, also play an important role in why we eat what we eat. Even though Australians may be aware that they do not consume enough plant-based foods, and too much processed food, this may not be sufficient to change. A 2005 report by the World Health Organisation explores the factors influencing vegetable consumption and groups them into the following three categories:

- (1) Social factors in which personal and family habits can be a barrier to changing consumption behaviours.
- (2) Environmental factors such as limited availability and quality of vegetables in local shops, transportation and storage limitations, and misperceptions of the effort required for cooking (Anderson, Cox, McKellar, Reynolds, Lean, & Mela, 1998).
- (3) Economic factors that include costs associated with increasing vegetable consumption (Pomerleau, Lock, Knai, & McKee, 2005).

Greger (2016) confirms that the environmental context is an important influence in people’s diets: “the primary reason diseases tend to run in families may be that diets tend to run in families” (p. 12). The critique of industrial agriculture and the Western diet reveals a need for a more sustainable system. In Australia, urban foraging, which has its roots in

Indigenous Australian foraging traditions, is becoming more popular today as individuals are seeking connection with their food sources.

From foraging to urban foraging

Foraging is defined as searching for wild food resources. It used to play an essential role in humans' ability to survive and reproduce as foraged foods were the primary diet for pre-industrial, pre-agricultural societies. Aboriginal Australians have eaten native animal and plant foods gathered from the wild for an estimated 60,000 years. The Yirrganydji people – an indigenous rainforest and coastal culture belonging to the Djabugay language group of Far North Queensland – had an intimate knowledge of their lands and waters, flora and fauna, seasons and weather. They were both rainforest-dwelling and seafaring people, using resources of both environments for their food and clothing. As a gatherer-hunter society, they foraged up and down the coast following seasonal food sources (their territory comprised the strips of land between the areas known as Cairns and Port Douglas, including Freshwater Creek and the Barron River). While the rivers and sea yielded barramundi, eels, prawns or turtles, the Yirrganydji people also hunted wallabies and cassowaries. Their fruit and vegetable intake included yams, figs, plums, lilly pilly, and various nuts and berries. The arrival of European agriculturalists disrupted the foraging practices of Aboriginal peoples. Colonial introduced farming based on non-native species was practiced in southern and eastern Australia, while tropical Australia supported ranch pastoralism (Paterson, 2017). As the landscape was slowly changing, some Aborigines remained on the fringes of the townships and tried to keep on living as hunters-gatherers, and many others were removed to mission stations. As a result, some Aboriginal hunter-gatherers became herders, domestic animal handlers, and gardeners.

Urban foraging, which is the foraging practice applied to urban areas, is a growing trend in post-industrial countries, including high density tropical cities such as Singapore and Hong Kong. Looking for edible wild plants in the city is part of a larger movement towards sustainable living, local eating, and urban homesteading. In the context of tropical North Queensland, it means gathering indigenous and introduced edible wild plants and fruits from streets, parks, railway reserves, and other urban places. Recently, the recognition of the nutritional and gourmet value of native foods by non-indigenous Australians is introducing native cuisine to the broader population. Several decades ago, authors A.B and J.W. Cribb (1975), biologist Tim Low (1988), or former army soldier and TV presenter Les Hiddins (1999) - also known as 'the Bush Tucker Man' - were among the first authors/presenters to share their knowledge of the Australian bush. Today, native Australian foods are made popular by renowned chefs like Matt Stone, who works at the Oakridge winery restaurant in Victoria's Yarra Valley, or René Redzepi, founder of the restaurant Noma, who is famed for foraging Indigenous ingredients. Redzepi opened a pop-up restaurant in Sydney in 2016. He would spend hours every morning walking

through the Blue Mountains, near Bondi Beach, and into suburban neighbourhoods to gather wild edibles (Gordinier, 2016). Redzepi asserts that “Everyone should grow up as a forager. Knowing your ABCs in nature, the flora and fauna, the patterns of the landscape and the rhythm of the seasons is as important as learning how to read and write” (Tesauro, 2017). Matt Stone practices urban foraging and learnt about preparing sustainable, locally-sourced whole foods when he started as a chef at Greenhouse Perth in 2005. Today, working at the Oakridge winery restaurant, Stone organises dinners at which 85 percent of the ingredients are foraged. Likewise, Dick Copeman helped found Northey Street City Farm in Brisbane in 1994. While the farm is a successful example of urban farming which offers workshops on permaculture, Copeman also promotes urban foraging: “You can just walk through any open space land... and there’s plants that grow in those green areas, including weeds, some of which are edible” (Buzacott-Speer, 2017). Greens commonly found around Brisbane include chickweed, milk thistle, plantain or dandelion. You can also find bush foods like lilly pilly, bunya nuts, macadamia nuts and warrigal greens, while native mulberries are common along creek beds. Additionally, North Queensland abounds with wild mangoes, paw paws and coconuts (Low, 1998). Angela Hirst, director of Wandering Cooks in Brisbane, promotes food communities and unites artisan food producers, chefs, buyers, suppliers, and educators. An incubator for food start-ups, Wandering Cooks is trying “to bridge the gap between community gardens and upmarket chefs” explains the spokesperson Dick Copeman. He adds, “I don’t think there’s many restaurants actually serving chickweed spanakopita” (Buzacott-Speer, 2017). Chickweed, a nutritious and healthy vegetable, can be found in most Australian gardens (Alice, 2017). However urban foraging must be done properly as Redzepi explains: “It’s like any other foraging: it’s a good thing to encourage, as long as it’s done responsibly and respectfully, by which I mean pick only what you need, not taking whole plants” (Tesauro, 2017).

Urban foraging may be a solution to reconnect to nature in the midst of our high-tech city lives and to heal what American journalist Richard Louv calls the nature-deficit disorder. Louv (2012) argues, in *The Nature Principle*, that “the more high-tech our lives become, the more nature we need” (p. 326). Although some authors (Thomas, 2017) are trying to embrace both nature and technology and find a balance between the two, explaining that the Internet and its connectivity have benefits, just as nature has benefits, more and more scientists are proving that natural environments benefit human health while digital technology upsets human physiology (Avendano, Mata, Sanchez Sarmiento, & Doncel, 2011). As neuroscience develops, researchers are uncovering functional aspects of the anatomy and physiology of the human brain, allowing them to study how environmental factors influence cognitive, mental, and physical health (Selhub & Logan, 2012). Urban foraging is a way to strengthen our connection to nature, and by spending time outside in nature while searching for edible wild plants, to reduce stress and improve health (Williams, 2017).

Foraging is also a good way to get to know nature and extend our knowledge about plant diversity. It brings attention to provenance and seasonality, and, to some extent, it can help alleviate the increasing environmental costs of a distribution chains that transport items back and forth all over the world.² Industrial agriculture has resulted in a loss of variety in plant consumption. There are over 120,000 edible plants worldwide, however only about one thousandth of those end up in markets and supermarkets, and only about 30 of those are used most commonly. In the meantime, biodiversity is increasingly recognized as critical to human life (Bernstein & Chivian, 2008). The relationship between agriculture and biodiversity can be understood in two ways: first, as the biodiversity within farmland landscapes (i.e. the biodiversity of soil microbes, birds, insects, etc.) and also as the biodiversity of agricultural crops, called ‘agrobiodiversity’ (varieties of wheat, tomatoes, etc.). The Food and Agriculture Organization of the United Nations (2010) has estimated that during the last century, 75 percent of crop genetic diversity has been lost, a phenomenon called ‘genetic erosion.’ This loss is dangerous because it makes our food supply more vulnerable to outbreaks of pests and disease. Scientific research is starting to show the health benefits of indigenous foods that grow wild in native soil, free from fertilisers and genetic modification (Alice, 2017). Many are rich in antioxidants, enzyme regulators and anti-inflammatory substances. For instance, the Davidson plum, native to the rainforests of Queensland, is now being called a superfood. The Davidson plum has many health benefits as it contains high levels of anthocyanin and potassium, along with important antimicrobial properties, which improve cognitive function and protect against heart disease (The Australian Superfoods, 2015). On average, plant foods contain sixty-four times more antioxidants than animal foods as researchers explain: “Antioxidant rich foods originate from the plant kingdom while meat, fish, and other foods from the animal kingdom are low in antioxidants” (Carlsen, Halvorsen, Holte, et al, 2010). Foraging may provide additional health benefits by restoring emotional balance. Working with our hands and all our senses seems to alter the experience of time and helps us stay in the present moment. This is the benefit of what Pollan (2013) calls unitasking, in opposition to multitasking: “It seems to me that one of the great luxuries of life at this point is to be able to do one thing at a time, one thing to which you give yourself wholeheartedly. Unitasking” (p. 195). Taking responsibility for the food we eat via foraging and cooking is a way to reconnect with nature and to heal the imagined human/nature divide that underlies Western conceptions of the world.

2 It should be noted that resource-sharing is a complex issue as was pointed out by Hardin (1968). In *The Tragedy of the Commons*, he describes how a shared-resource system where individual users, acting independently according to their own self-interest, behave contrary to the common good of all users by depleting or spoiling that resource through their collective action.

Healing human/nature dualism through urban foraging and cooking

Human/nature dualism is a predominant concept in Western culture. This dualism defines nature and human as separate and distinct (Bayet, 1998; Cronon 1995; Oelschlaeger 1991). This concept also pervades our beliefs about plant foods and our relation to nature through food, which is why urban foraging can be a tool to reconcile the natural and human realms. Ecopsychology is a discipline that views the health of the individual in a context of the health of the planet itself, embracing the notion that the two are inseparable. Nutrition represents a critical component of this field – Selhub and Logan (2012) talk about ‘nutri-ecopsychology’. According to ecopsychology, positive emotions foster environmentally responsible behaviours (Milton, 2002), and nutritional patterns can influence emotions (Spencer et al., 2017). Connectivity to nature and a greater connection to the naturalness of dietary items – foods in their whole-food form – are solutions to promote healthy nutrition, healthy people and a healthy planet. When people become personally involved in the development or production of their own food (via foraging or gardening, for instance), they begin to have an appreciation of the concept of naturalness. In this respect, nutrition represents a pivot between ecology and psychology, and it helps people understand how dietary choices, fostered through contact with nature, can help us and the planet as well. Some Western ideas of nature are closely linked to that of wilderness. The American Wilderness Act of 1964 defines wilderness as a place where humans do not stay or live. Cronon (1995) writes about the complexity of this definition and its lack of practicality in our everyday lives: “If we allow ourselves to believe that nature, to be true, must also be wild, then our very presence in nature represents its fall. The place where we are is the place where nature is not” (pp. 80-81). Max Oelschlaeger (1991) also criticizes the idea of wilderness, and ultimately that of nature, as a place where human beings cannot live. He reflects on how impossible it is for Western societies to conceive of home and nature as one and the same place. According to him, this conceptual separation results in a romanticised view of nature, which can be seen in the mythology created around hunter-gatherer communities:

The idea of 'being lost in the wilderness' logically necessitates a geographical referent conceptualized as home as distinct from all other places; but for Paleolithic people home was where they were and where they had always been. They could not become lost in the wilderness, since it did not exist. The conjecture that the conscious life of Paleolithic people was devoid of such ideas as 'being away from home' or 'in the wilderness away from the inhabited regions of earth' is thus plausible. (p.14)

Wilderness becomes a place to escape from civilization, and the wild, by definition, must be what escapes control. According to Salleh (1997), “In an aggressive and war-obsessed culture, wilderness carries the dream of gentleness and peace. To a materialistic, corrupt, and polluted society, it brings purification and spiritual transcendence” (p. 178). The conceptual split that Western culture has created between human and nature exists in our relation to food. Food - and plant food in particular - belongs by essence to nature. Plant foods are a product of nature, and when human beings feed themselves with plant foods, they connect to nature in another form (Selhub & Logan 2012). As Greger (2016) reminds us, plants get their energy from the sun through a process called photosynthesis. The chlorophyll in the leaves harnesses the sun’s

energy and transfers it to building blocks of matter called electrons. When we eat the plant, these electrons (in the form of carbohydrates, protein, and fat) are delivered to our cells. In the same way, Pollan (2013) says that “to forage greens is a daily reminder of nature’s abundance, the everyday miracle by which photons of light are turned into delicious things to eat” (p. 21). So, food is often described as belonging to the natural side of the human/nature duality in Western culture. In this respect, nature is opposed to culture, and senses are opposed to reason. Janet A. Flammang (2009) explains that:

Food is apprehended through the senses of touch, smell and taste, which rank lower on the hierarchy of senses than sight and hearing, which are typically thought to give rise to knowledge. In most of philosophy, religion, and literature, food is associated with body, animal, female, and appetite – things civilized men [*sic*] have sought to overcome with knowledge and reason. (quoted in Pollan, 2013, p. 11)³

The human/nature binary is a core problem in our approach to the current ecological crisis and climate change issues. Natural and human systems are interconnected and have complex relationships. If one element is affected, the cascading and often exponential effect can have a profound impact throughout the ecosystem (Harding, 2016). However, political actions, laws and social commitments will not help create a sustainable future unless we start by acknowledging the limits of a dualistic imaginary. As William Cronon (1995) argues: “To the extent that we live in an urban-industrial civilization but at the same time pretend to ourselves that our real home is in the wilderness, to just that extent we give ourselves permission to evade responsibility for the lives we actually lead” (p. 81). It is essential for city residents to reconnect to nature even in an environment of concrete buildings and tarred roads - even more so. Urban foraging may be, for city residents, one of the easiest ways to get in touch with nature. Australian professor Glenn Albrecht, director of the Institute of Sustainability and Technology at Murdoch University, talks about the way people suffer when they withdraw from nature. He coined the term ‘solastalgia.’ This term combines the Latin word ‘solacium’ (comfort, solace) and the Greek root ‘algia’ (pain) to form solastalgia. Albrecht (Albrecht et al., 2007) defines solastalgia as a feeling of chronic distress caused by negatively perceived changes to a home and its landscapes. Today, an increasing number of people live in urban areas, in cities. Yet scientists have demonstrated that we are linked to nature and that our nervous systems are built to resonate with referents from the natural world (Atchley, Strayer, & Atchley, 2012; Williams, 2017). Lack of nature is the cause of many psychological and physical problems (Louv, 2012). As a result, we experience this longing, this feeling that something is missing, or as Albrecht (2012) puts it, this feeling of

³ The gender bias according to which women are not seen as equal to men but are put in the same category as bodily senses, animals and nature, while men belong to reason, intellect and culture.

“homesickness you have when you are still at home.” Solastalgia gives expression to those gut feelings we have facing a loss of our sense of place while our built and natural environments are changing so quickly. Albrecht (2012) confirms:

Under the intertwined impacts of global development, rising population and global warming, with their accompanying changes in climate and ecosystems, there is now a mismatch between our lived experience of the world, and our ability to conceptualise and comprehend it.

Urban foraging, like any practice that takes us back to nature, is a way to soothe this feeling of alienation, this impression that we are not nature. The ‘environment’ suddenly begins to seem a little less out there and a lot closer to home. Bringing back nature to home can also be expressed through cooking. Our relation to food mirrors our relation to the natural world.

Our energy and well-being, physical and mental, are dependent in the main upon the composition and the quality of the diet. All of it, except fish and other food taken from the ocean and inland waters, is derived from the soil, whether in the form of grains, fruits, or vegetables, or in the form of meat and milk of animals which, in turn, live upon plant life. Man must know and respect nature. (National Education Association of the United States, quoted in Selhub & Logan, 2012, p. 199)

But the industrial system obscures the origins of the foods it produces by processing them to such an extent that they appear as products of culture rather than nature (Pollan, 2013). As we have seen earlier, the convenience of packaged meals does not promote cooking at home. On the contrary, it increases our dependency on industrial food. “We’re all looking for someone else to cook for us. The next American cook is going to be the supermarket. Take-out from the supermarket, that’s the future. All we need now is the drive-through supermarket,” Balzer says (quoted in Pollan, 2013, p. 189).⁴ Researchers agree that taking back responsibility for feeding ourselves would be a way to connect with nature (Campbell, 2014; Schatzker, 2015). Matt and Lentil Purbrick, a young couple living near Melbourne, went back to the land and left behind their city life and their jobs to live on a self-sufficient farm. They promote what they call ‘traditional living made modern’ in their book *Grown & Gathered* (2016):

This book is about our experience of returning to nature and the lessons we’ve learnt. It’s about connecting to our food and understanding the traditional village life of our ancestors. And it’s about what it really means to eat a natural,

⁴ If the drive-through supermarket may be the future, as Balzer explains, supermarkets have been delivering groceries to people’s homes for many years now, making it always more convenient to purchase industrial food.

regional diet. It's about observing, growing, gathering, nurturing, trading, seeking and eating with the seasons. And it's about experiencing the whole process from start to finish – even if only once – and connecting with the people who do it everyday. (p. 9)

Pollan (2013) explains that cooking our own food involves us in a whole web of social and ecological relationships, with plants and animals, with the soil, with farmers, with microbes both inside and outside our bodies, and with the people we are sharing our food with. He states that:

Our growing distance from any direct, physical engagement with the processes by which the raw stuff of nature gets transformed into a cooked meal is changing our understanding of what food is. The idea that food has any connection to nature or human work is hard to credit when it arrives in a neat package fully formed. Food just becomes another commodity, an abstraction. (p. 9)

The Purbricks (2016) support this theory. They write that people are removed from what actually happens in nature and from what is actually sustainable, and this is why they need to begin to experience their food again:

We realised that we had been slowly separated from our food one meal at a time. Once upon a time, our food was either grown by us or by our neighbours. Then it was grown ten kilometres away. Then it was available in nicely packaged parcels in small, local stores... And finally, the ultimate demise: pre-packaged meals and fast food. (2016, p. 13)

Western countries are facing opposite trends where diet and food are concerned. You can eat junk food or grow your own vegetables. But are these trends really opposite? It would be more accurate to say that they are, like culture and nature, opposite yet not opposed. Weaver (2016) writes “There is no such thing as ‘junk food’. There is only ‘junk’ or there is ‘food’” (p. 30). We are constantly opposing man-made things to nature-grown things. But when we cook, both nature and culture are transformed by the work. Inspired by Claude Levi-Strauss, Pollan (2013) writes that cooking involves transforming “the raw of nature into the cooked of culture” (p. 6). In his 1964 book *The Raw and the Cooked*, Levi-Strauss explores the nature/culture binary on the culinary level. He argues that myth describes and explains the evolution of cooking techniques, and that the transformation of cooking is also a cultural process. Indeed, cooking puts us in the world in a very special place, facing the natural world on one side, and the social world on the other. In this respect, the urban forager stands between nature and culture. Conducting a process of translation and negotiation between both nature and culture, the urban forager can be considered as

working towards a reconciliation between human and nature, going from the human/nature dualism to a human-nature connection. Urban foraging, while a response to the industrial food system, can help to heal the philosophical split between human and nature so that the food we see as products of industry can feel more like products of nature again.

Conclusion

Urban foraging, through gathering wild foods, is an attempt to connect to the source of nature. To some extent, it remains a practice determined by Western culture in reaction to the industrial food system and a human/nature dualism that imagines nature and human as separate. Urban foraging, as a shadow of industrial agriculture, is both an answer to a non-sustainable food industry and an attempt to connect with nature. Urban foraging is a way to heal our human-nature disconnectedness, to soothe solastalgia (Albrecht et al., 2007) and to focus on nature in the middle of the city, a place where nature is not necessarily obvious. How we choose to live can make a difference in our happiness and our health. As Wendell Berry (1981) asked: what is the environmental crisis if not a crisis of the way we live? And if the environmental crisis is ultimately a crisis of character as Berry said, it will have to be addressed at the individual level. Our diet can be a place to start. If changing our attitudes towards nature to foster a more sustainable future implies for many researchers (Plumwood 1993; Cronon, 1995) to start with what is in our minds, changing our diet can also be a way to alter how we think (Zaalberg et al., 2010).⁵ I will finish this paper, as I started it, with a quotation from Salleh (1997) that reminds us how much we have to learn from Indigenous communities:

In practical terms, hunter-gatherers would have to be the affluent societies *par excellence*. They are self-sufficient and thus genuinely autonomous. They have a stable interchange with their habitat; they use low-impact technologies; they work only a few hours a day, and give energies to social bonds, ceremony, and art. Ecologists taking a lesson from Aboriginal cultures might discover how to devise low-demand, low-impact economies where sustainability and social equity can go together. (p. 195)

Biography

Melusine Martin is a PhD candidate under a Cotutelle agreement between the James Cook University, Australia, and the Paris-Sorbonne University, France. Her research

⁵ A Dutch study (Zaalberg et al, 2010) examined the effects of a daily multivitamin and fish oil combination or two placebos on the behaviour of 221 young adult prisoners. They reported a 34 percent reduction in serious offences among the active group, versus a 14 percent reduction in the placebo group.

focuses on environmental humanities, environmental philosophy and ecofeminism. She is a former English teacher and interpreter. She currently is a Research Fellow at The Cairns Institute for Research in Tropical Societies, and her aim is to provide a new idea of nature based on a critique of Western culture characterized by the human/nature dualism and to analyse how our representations of nature play an essential role in human wellbeing.

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