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Developing typologies to use as an ecopsychological framework for understanding the relationship that people have with the biosphere in South Africa

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A thesis submitted to the Faculty of Humanities, University of the Witwatersrand, in fulfillment of the requirements for the degree of Doctor of Philosophy.

January, 2020

Declaration

I, Andrea Marais-Potgieter, declare that this thesis is my own unaided work. It is being submitted in fulfillment of the requirements of the degree of Doctor of Philosophy in the University of Witwatersrand, Johannesburg.

The research was funded by a scholarship received from the Southern African Systems Analysis Centre (SASAC).

It has not been submitted before for any degree or examination at this or any other University.



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Andrea Marais-Potgieter

2020

One paper based on data from this research has been submitted for publication in a peer reviewed journal with the title: Understanding complex interactions that influence relationships with the biosphere.

A second draft paper that has not yet been submitted to any journal is included in appendix 7 with the title: Using a deductive approach to develop an enabling technique: Exploring people's relationship to the biosphere.

Dedicated to my mother, Annemarie Marais (†). She was a fierce and fiery woman who taught me to take no nonsense from the world, and always save water. Without her belief in me I would have never been able to embark on this PhD journey. She remains my strength, inspiration and support from wherever she is, watching over me.

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"As scientific understanding has grown, so our world has become dehumanized. Man feels himself isolated in the cosmos, because he is no longer involved in nature…His contact with nature is gone, and with it has gone the profound emotional energy that this symbolic connection supplied." (Jung, 1964; p.95)

Nature and animals; thank you for your nurturing energy, inspiration, beauty, forgiveness and solitude spaces.

Abstract

The Intergovernmental Panel on Climate Change has raised the alarm for humanity to address its pathological relationship with the biosphere. Individual differences, interacting as a system, often influence how people relate to and behave towards the natural world. However, there is a lack of empirically based ecopsychological research exploring multiple individual attributes, such as affect, that form systems. Individual differences impact the relationship that people have with the natural world, especially in developing countries. Understanding differences between individuals encourages the strategic design of planetary-focused interventions such as advocacy, policy, and technology development. Although much has been written about typologies, their complexity is poorly identified or articulated. As such there is a limited understanding of the human-nature nexus and how complexity influences the relationship individuals have with the biosphere.

By using intrinsic, affective, cognitive, and behavioural constructs, this study sought to identify different types of people and their relationship with the biosphere. The study used an explanatory, sequential, mixed-methods design to identify, describe, and then explore typologies.

A sample of 753 people was obtained through an online quantitative questionnaire battery. Results from the factor and cluster analyses showed that six heterogeneous typologies existed. Following the identification of the six typologies, individual interviews were conducted with 44 participants representing each of the typologies: The *Disconnected*, *Observer*, *Misunderstood*, *Hero*, *Explorer*, and *Hedonist*. The qualitative data were analysed using Grounded Theory Method in order to build ecopsychological theory. The typologies and associated theory provide insight into the similarities and differences between people based on a systems interaction of their life experiences, environmental worldview, concerns, biospheric affect, behaviour and beliefs about climate change.

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CHAPTER 1
INTRODUCTION

1.1 Background to the study

This year many fires were raging through the Amazonian lungs and other areas on the earth in another anthropogenic (Intergovernmental Panel on Climate Change [IPCC], 2018) expression of the pathological relationship humanity has with nature (Fisher, 2013). The destructive fires do little to encourage individuals to link their consumption habits to environmental destruction (Cederberg, Persson, Neovius, Molander, & Clift, 2011). Locally, temperatures in Africa are rising faster than the global average, and South Africa has reached its planetary overshoot sooner than many other countries (Volschenk, 2019). Furthermore, the latest national biodiversity assessment report 2018 (South African National Biodiversity Institute [SANBI], 2019) shows that almost half of the 1 021 ecosystem types are threatened, ringing alarm bells about the South African human-nature nexus.

Individual psychological distance from the climate crisis has led humanity to a precipice where we can either address our dysfunctional relationship with the biosphere or face the consequences of runaway climate change (McKinnon, 2009) and ultimate societal collapse (Bendell, 2018). Climate psychology aims to understand the source of ecologically maladaptive individual behaviours in the context of burgeoning and imminent environmental collapse (Andrews & Hoggett, 2019). Meanwhile, the field of ecopsychology aims to repair the individual relationship with nature using a strategy of affective connectedness (Roszak, 1992). This study moves between these two fields to understand nuanced ways to address the environmental problems through exploring the individual-nature nexus.

1.1.1 Addressing environmental problems

At the core of the proposed study is the idea that since environmental problems are anthropogenic, individuals need to be at the forefront of the solution, and psychology needs to provide empirically-based guidelines for strategic approaches. Fisher (2013) notes, "*There is, moreover, little public recognition that this crisis is indeed a psychological one. This lack of recognition extends most crucially to the arena of psychology itself*" (p. 7). According to Adams (2005) and Hibbard (2003), part of the problem is that the field of psychology has ignored the relationship that individuals have with nature. Kidner (2007) noted that most psychologists are reluctant to regard these ecological crises as proof of the pathology in the relationship between humanity and the natural world. Psychology is criticised for its dualistic view of environmental challenges as comprising separate individual and ecological problems, leading to subsequent repression (Adams, 2005). Adams (2005) challenges three fundamental presumptions of modernism; namely our exclusionary identification as ego-centered subjects, our belief that there is a separation of humans (self) versus nature (world), and the anthropocentric notion that humans are the exclusive locus of meaning and value. Fisher (2013) identifies the problem as being inherent in the current worldview of Western psychology, which is essentially dualistic: a problem that ecopsychology aims to overcome.

Ecopsychology recognises that ecological problems are rooted within deformed understandings, stifled contents, conscious denials, and unconscious projects, which are both personal and societal dimensions of the human mind (Yunt, 2001). This suggests that unless we address the crises internally, we cannot make a difference in the external world: thus the ecological problem is a problem of the psyche (Hibbard, 2003). Therefore, these challenges need to be approached in the context of two of life's most noticeable polarities: the personal versus the collective and the conscious versus the unconscious (Yunt, 2001).

1.1.2 Understanding the human-nature nexus

Individual attitudes and actions, such as having one fewer child, living car-free, avoiding airplane travel, and eating a plant-based diet, are highly effective to reduce an individual's impact on the biosphere (Wynes & Nicholas, 2017). However, research focusing on understanding the relationship that individuals have with the biosphere needs to determine why most people are not engaging in these pro-environmental behaviours. Typologies provide an effective platform for exploring different types of relationships and help to build theory (Doty & Glick, 1994) to understand this disconnect. The role of typologies is to reduce complexity in the empirical realm by using the min-max rule to construct a minimum number of types, where each demonstrates a maximum amount of homogeneity (Doty & Glick, 1994). Furthermore, the role of typologies is to acknowledge the multidimensionality of human nature, taking into consideration interactions between multiple individual characteristics (Fiss, 2011). Typologies stretch beyond traditional linear models of causality; they allow for the exploration of various relationships between variables; they can account for levels of causal complexity and can function as a shorthand device for cognitive simplification of a complex individual within a systems orientation (Doty & Glick, 1994; Meadows, 2008).

A multi-structural framework is useful for identifying individual differences to build typologies that explain the relationship with the biosphere because there is no simple model for understanding human behaviour and focus needs to be on both biospheric and human processes as interdependent parts of an ecosystem (Saunders, Brook, & Myers, 2005). There are four multi-dimensional constructs used in this study; namely the intrinsic (Corner, Markowitz, & Pidgeon, 2014; Gifford & Nilsson, 2014; Sabini, 2008; Schwartz, 2009), the cognitive (Dunlap, 2008; Lewis, 2009; Schultz, Shriver, Tabanico, & Khazian, 2004; Swim et al., 2009; Tauber, 2012), the affective (Beery & Wolf-Watz, 2014; Ojala, 2012; Roszak, 1992; Semenya, 2013), and the behavioural (Berndt & Gikonyo, 2012; Herzog, Pershing, & Baumert, 2005; Organisation for Economic Co-operation and Development [OECD], 2008; Zarepour, 2012). Using typologies as systems and theory has previously been limited, with most typological studies being linearly constructed (Barnes & Toma, 2012; Bernstein & Szuster, 2018; De Groot & Van den Born, 2003; Hall, Lewis, & Ellsworth, 2018; Hunka, De Groot, & Biela, 2009; Leiserowitz, Maibach, & Roser-Renouf, 2009; Pike, Herr, Minkow, & Weiner, 2008; Poortinga & Darnton, 2016) without building theory or understanding the relationship between variables that shape individual systems. These linear approaches are inadequate for understanding the complex relationship individuals have with the biosphere (Ingulli & Lindbloom, 2013) since they assume cause-effect without acknowledging complex interactions between multiple constructs. As such, they provide superficial insights that fail to explain

the complexity inherent in the human-nature nexus and what that subsequently means for biospheric issues such as climate change. As a consequence they tend to produce results that lacks a deeper understanding of the reasons why individuals have this type of relationship with the biosphere. They are also problematic since they fail to explore the affective component of the relationship. Furthermore, there is a lack of typologies that aim to explore the human-nature nexus in developing countries and more specifically, in Africa. Most of the typologies constructed are in the USA, with some work extending the typologies into Asia and Europe (Metag, Füchslin, & Schäfer, 2017). This focus on developed countries is problematic as it ignores the nuances in developing countries that could lead to a different and deeper understanding of the human-nature nexus, such as that required to address environmental challenges in South Africa.

1.2 Study rationale

The present study is justified and guided on the basis of the stated premises:

- The natural world is in crisis and the crisis is primarily a psychological one (Fisher, 2013)
- In order to address the environmental problems a non-linear approach needs to be used to avoid simplification of a complex problem (Gifford & Nilsson, 2014; Kollmuss & Agyeman, 2002)
- A non-linear approach of typology development could provide insight into how the environmental crisis can be addressed from an individual perspective (i.e. intrinsic, cognitive, affective, and behavioural) of which there is currently a gap (Markowitz, Goldberg, Ashton, & Lee, 2012)
- Most of the typological studies conducted have been in developed countries. Corner, Markowitz and Pidgeon (2014) argue that although research in the environmental paradigm is proliferating, there is still limited research that focuses on values and climate change in the public domain in non-western nations
- To date, ecopsychologists have relied heavily on relevant theories from other disciplines indicating a need to build ecopsychological theory to move the field forward as well as to understand types of ecopsychologically based typologies that function as systems (Hibbard, 2003)

1.3 Study aims

Environmental concern does not necessarily translate into pro-environmental behaviours. This lack of connection suggests an opportunity for ecological narratives to be expanded using individual intrinsic, cognitive, affective, and behavioural influences that take into consideration the everyday challenges that individuals face (Pike et al., 2008) and how that impacts their environmental attitudes and behaviour. Pro-environmental behaviour is likely to be more effectively influenced when interventions target non-environmental motivations based on social norms, identity, history and other factors rather than only environmental concerns (Department for Environment, Food and Rural Affairs [Defra], 2008). This approach recognises that individual behaviour might look the same, but individual reasons for behaviour are different, with a motivation for one individual possibly being a barrier for another individual (Axon, 2017; Defra, 2008).

The research in this thesis is designed to address a gap in knowledge in the field of ecopsychology to understand how different types of people relate to the biosphere and what influences this relationship.

Through creating heterogeneous typologies, the aim is to construct multi-faceted typological systems. The purpose of the study is therefore to gain an in-depth and nuanced understanding of the types of people and their relationship with the biosphere that will allow for informed environmental policy development (Dalal-Clayton & Bass, 2009), green technology development and adoption, therapeutic interventions, pedagogical approaches, and marketing efforts (Dwyer, Leeming, Corbern, Porter, & Jackson, 1993; Leiserowitz, Maibach & Roser-Renouf, 2009) in South Africa. The study aims to build typologies, theory, and systems through using an explanatory sequential mixed methods design.

1.4 Research questions

1. Based on people's relationship with the biosphere and individual differences, which typologies exist in South Africa?
2. How do these typologies differ from each other?
3. What typologies describe South African individuals' reported relationships with the biosphere and how are these types explained through experiential accounts?
4. What ecopsychological theory can be developed to describe each of the identified typologies?

1.5 Outline of thesis

Chapter 1 provides a brief introduction to the study, noting the research problems and associated questions.

Chapter 2 situates the study within the field of ecopsychology, explaining the emergence of this new field and how it compares to traditional psychology and deep ecology. This is followed by a discussion of the leading causes of disconnection from nature. The chapter then describes research conducted on the human-nature nexus in South Africa, pointing out gaps in our historical understanding. The chapter continues by mentioning connection to nature strategies, of which micro campaigning is one. For effective interventions to be designed, the human-nature nexus needs to be understood as a complex interaction of various intrinsic, cognitive, affective and behavioural constructs. These constructs are described as part of the criteria for building useful typologies as systems and theory. Using these criteria, global warming/climate change/sustainability, positionality, biodiversity, behavioural, animal-related, eco-tourism and green marketing typologies are evaluated. The chapter concludes with a discussion on using systems thinking to understand the human-nature nexus.

Chapter 3 describes the methods, providing context for the explanatory sequential mixed methods design implemented. A systems model for the mixed methods process is discussed, looking at the eight phases of the study that move from a deductive towards an inductive approach. Furthermore, the intrinsic, cognitive, affective and behavioural constructs, dimensions, measures and variables are described. Following this is an explanation of the quantitative data collection procedure, including the survey tool used, participant sourcing, survey pilot, and fieldwork ethics. The quantitative analysis procedure is described, covering descriptive analysis, factor analysis, cluster analysis, and discriminant analysis. The methodological description then moves onto the qualitative phase of the study and discusses participant recruitment, the interview guide, the enabling technique, pilot interviews, and the

in-depth interviews conducted in Cape Town, Durban, and Johannesburg/Pretoria. Processes employed during the fieldwork, such as fieldwork journaling and cluster mapping, are explained. Furthermore, the transcription process and Grounded Theory analysis are discussed, including the coding processes, constant comparison technique, analytic memos and validation procedure. Finally, the chapter ends with a methodological look at building typologies as systems and the analytic lens employed by the researcher.

Chapter 4 reports the quantitative results starting with the identification, sizes and Euclidean distances between typologies. The typologies are further described based on their clustering variables that include connectedness to nature, shifting responsibility, the role of individual, apathetic attitudes, human-centric, resource-centric and science-centric variables. Cluster profiling included environmental worldviews, climate-centric, animal exploitation, animal extinction, the role of government and role of technology. The chapter continues with a description of differences between typologies, including those relating to behaviour, values, and personality. Typological lenses are reported, based on issues that are most important versus least important to typologies. Typology differences on environment and animal issues, awareness, concerns and locus of control are discussed. Lastly, the chapter explores demographic differences between typologies that includes age, gender, ethnicity, religion, education, upbringing, home language, occupation, personal income, household type, and relationship status. The chapter concludes with a Venn wheel showing the relationship between typologies that are compared using the different variables, followed by a table that summarises vital distinguishing characteristics of each typology to be used in the systems design model that follows in Chapter 6.

Chapter 5 reports on the qualitative results starting with an example of Grounded Theory architecture to familarise the reader with the structure of the chapter. The chapter starts by showing the categories, properties and dimensions, and associated verbatim quotations for each typology. Each property has an associated role described as the functional pillar, micro-condition, macro-condition, and consequences or processes. The categories for the *Disconnected* typology are abandoned and disconnectedness. The categories for the *Observer* typology are observer, nature as blurred, and climate change contrasts. The categories for the *Misunderstood* typology are misunderstood, diminishing nature, and humans can be bad. The categories for the *Hero* typology are hero, nurturer/peace keeper, people-centric, and impacted by climate change. The *Explorer* typology categories comprise explorer, universalism, interconnectedness with nature, and climate change as changing relationship with nature. Finally, the *Hedonist* typology is discussed in the context of the hedonist, struggles with the outside world, poor relationship with nature, and apathetic feelings towards climate change categories. The chapter ends with a summary of key aspects from each typology to be used in the systems design model that follows in Chapter 6.

Chapter 6 is an integrative discussion chapter that merges the quantitative and qualitative results into a tapestry of insights that builds systems. The chapter explores each typology functioning as a system, and this is shown in a joint display. After describing each typological system, the typology theoretical statement is presented, followed by a comparison with existing typologies. The chapter continues to explore how the six typologies can be classified within three types of systems, namely isolated systems,

transitory systems, and connected systems. Finally, by using the systems approach, the chapter ends with intervention suggestions. Overall, this chapter provides new knowledge in the field of climate and ecopsychology through using systems thinking to build typological theory. Furthermore, the chapter provides a new way of exploring intervention strategies based on types of systems in the context of nuanced typologies.

Chapter 7 is the concluding chapter that provides a synopsis of the study, followed by implications of the study, limitations and suggestions for future research.

CHAPTER 2
LITERATURE REVIEW

2.1 Introduction

The world is entering its sixth mass extinction, and this one is anthropogenic (Ceballos, Ehrlich, & Dirzo, 2017) and labelled a planetary emergency (Eisenstein, 2011; Lovelock, 2006; Roszak, 1992). According to the warnings issued by Carson (1958) and Leopold (1948), some of the issues currently facing the biosphere are climate change, deforestation, biodiversity loss, extinction, human overpopulation, and pollution (The Earth Charter Commission, 2000; World Economic Forum, 2014) with the latest Intergovernmental Panel on Climate Change report (IPCC, 2018) giving humanity 12 years to address these issues. Ecopsychology (Fisher, 2013; Roszak, 1992) isolates these issues as evidence that the relationship that people have with the biosphere is pathogenic. Africa, in particular, has been identified as being both a contributor as well as highly susceptible to the impacts of climate change (Brown, Hammill, & McLeman, 2007) and therefore a study of the human-nature nexus in South Africa, from an ecopsychological perspective, is overdue. Through understanding the relationships that individuals have with the biosphere, targeted interventions can be designed (i.e. disaster risk management), related technology can be developed, and effective policies implemented to influence behaviour. Individual attitudes (Wang, 2017) and behaviour such as having one fewer child, living car-free, avoiding aeroplane travel, and eating a plant-based diet are highly effective in reducing the individual's impact on the biosphere (Wynes & Nicholas, 2017). However, research focusing on understanding the relationship that individuals have with the biosphere and how that affects behaviour needs further exploration to try and understand the lack of adoption of high-impact behaviours such as those mentioned above (Lindqvist, 2010).

This chapter will provide an overview of the field of ecopsychology to show how it expands traditional psychological perspectives by focussing on the human-nature nexus and associated affect. Following is the exploration of using typologies to understand the complexities inherent in this human-nature nexus and the importance of distinguishing between different types of nature relationships. Some existing nature-nexus typologies will then be explored, followed by a discussion on the importance of systems thinking in making sense of the complexity inherent in typologies.

2.2 Ecopsychology

The field of ecopsychology situates environmental issues in the damaged affective relationship that individuals have with the biosphere (Fisher, 2013). This is different from Western psychology that typically views ecological challenges as separate individual and environmental problems (Hibbard, 2003; Kidner, 2007). Ecopsychology challenges assumptions of traditional psychology, namely our exclusionary identification as ego-centred subjects, our belief that there is a dualistic separation of humans (self) versus nature (world), and the anthropocentric notion that humans are the exclusive locus of meaning and value (Adams, 2005). There is a chasm between the worldview of Western psychology and ecopsychology due to the former's focus on dualism which ecopsychology is aiming to overcome

(Fisher, 2013). As a field, ecopsychology is well poised to explore, understand and provide direction to address the current environmental crisis. This section aims to describe the area of ecopsychology further and to demonstrate the importance of understanding the affective (emotion) component of the human-nature nexus as well as to show the gaps that must be closed to empirically further theory in the field of ecopsychology.

2.2.1 The emergence of a connected psychology

Ecopsychology is an interdisciplinary field that started emerging before Theodore Roszak (1992) coined the term. The term “ecopsychology” combines ecology, the branch of biology that deals with the relationships between living organisms and their environment, and psychology which is the study of the mind and soul including the way they function and how they affect behaviour and motivation (Bucci, 2012). Carl Jung raised concerns about the repression of nature, animals, creative fantasy and the primitive side of humans at a seminar in 1923 and this formed a thread throughout his work (Sabini, 2008). Robert Greenway (while working for Abraham Maslow) coined the term Psychoecology in 1963. Subsequently, the field of Deep Ecology, a movement started by Arne Naess in 1972 (Schroll, 2007), played a pivotal role in the emergence of ecopsychology. Ecopsychology also has roots in Environmental Psychology, Conservation Psychology, Ecological Psychology (Scull, 2008), Systems thinking (Bragg, 1996; Smith, 2010), Depth Psychology (Roszak, 1992) and Climate Psychology (Andrews & Hoggett, 2019). Ecopsychology is also called nature-based psychotherapy, eco-therapy, shamanic counselling, transpersonal ecosophy, green therapy, earth-centred therapy, and re-earthing (Fisher, 2013; Schroll, 2007; Schroll, Rowan, & Robinson, 2011; Winkelman, 2013). All these fields are concerned with understanding the causes and consequences of affective nature disconnectedness. The principles described in Table 1 and outlined by Roszak (1992), and earlier by Arne Naess in 1972, still form the foundations of the field today (Schroll, 2007).

Table 1: Principles that demonstrate the connectedness of ecopsychology and deep ecology (Roszak, 1992)

Ecopsychology	Deep ecology
• Repression of the ecological unconscious has led to environmental challenges; • A reconnection is needed between the ecological unconscious and the biosphere; • The ecological ego needs to be reawakened through earth based experiences; • Once awakened it will ignite a need for ethical responsibility towards the biosphere; • Ecopsychology aims to empower feminist approaches to counter the destruction of the biopshere; • Ecopsychology aims to address urban culture and its destructive nature; • Ecopsychology holds that there is a profound relationship between individuals and the biosphere	• The natural world has an inherent value that is not dependent on its use to humans; • The biosphere should only be accessed to satisfy primary needs; • Human population control is required to allow the non-human world to recover; • Biospheric domination by humans is becoming increasingly destructive; • An economic ideological shift is required to reduce environmental destruction; • Materialistic values need to be discouraged in favour of purposeful living; • Humans who value the biosphere have a obligation to drive the change needed

The above principles gave rise to theories that describe the human-nature nexus. These theories include the Biophilia hypothesis, Gaia theory, and feminist theory, and have helped shape the field of ecopsychology.

The Biophilia hypothesis proposed by Ed Wilson in 1984 views the human relationship to nature as genetic and biologically based (Kahn, 1997). More specifically, Wilson defines biophilia as the inborn inclination to focus on life and life-like processes, noting that understanding non-human animals will lead to valuing them, and as a consequence, to valuing ourselves. The hypothesis suggests that emotional affinity is unconscious, mediated by learning, and shaped by culture (Kellert & Wilson, 1993). The experience of affiliation can be intense and become pneumopoietic (a source of spirituality) (Falcicchio & Barbiero, 2015). Lovelock (2006) developed the theory of Gaia to describe more than just the biosphere, but rather the earth as a physiological system that has an unconscious goal of homeostasis. This theory views humans as the nervous system of the earth (Lovelock, 2006): *"The earth system behaves as a single, self-regulating system comprised of physical, chemical, biological, and human components"* (p. 25). Meanwhile, feminist theory addresses the destruction of nature by equating it to the oppression of women in a patriarchal culture. Both are an effect of a Galilean-Cartesian-Newtonian paradigm of reality (Adams, 2005) where violence towards women and gender exclusion underpins the incapacity to achieve sustainability (Pye, 2014). A study conducted by Liu, Geng, Ye and Zhou (2019) found that there is an implicit association between women and nature. Although these theories are valuable, there is a lack of empirically formed theories in the field of ecopsychology (Hoelterhoff, 2010) that can help ascertain a deeper understanding of the causes of the disconnection between individuals

and the biosphere that have become the Achilles heel of our modern society. One way of gaining a meaningful understanding of the human-nature nexus is through exploring affect.

2.2.2 The affective relationship between individuals and the biosphere

The relationship between individuals and the biosphere is non-linear and complex. Therefore a multifaceted approach that includes relational affect is required (Kollmuss & Agyeman, 2002). Attitudes and behaviour are popular yet inadequate constructs to use in isolation when investigating the human-nature nexus. Affect is a crucial component for understanding relationship dynamics (Roeser, 2012) because it influences beliefs, values, behaviour, attitudes and moral disengagement (Bandura, 2007) towards the environment, which leads to varied types of relationships ranging from being in touch with the natural environment to only having a latent connection (Baillie, 2003). A relationship affectively connected to the biosphere is described as nature affinity, Biophilia, nature commitment, ecological self, ecological identity, nature inclusion, nature-relatedness, or environmental sensitivity (Beery & Wolf-Watz, 2014).

Psychoterratic illnesses manifest when wellbeing is impacted by what happens to the biosphere (Albrecht et al., 2007). De Young (2013) mentions the importance of understanding concepts like grief experienced when people lose their affluent lifestyles as a consequence of environmental degradation. Grief would be a consequence of a connected relationship with the biosphere. A disconnected relationship with the biosphere is called nature deficit disorder (Louv, 2012) and has been found to lead to obesity, ADHD, isolation, and depression (Baker, 2013). Solastalgia is environmentally induced emotional distress and is explored in a mixed-methods study conducted by Albrecht et al. (2007) that found people feel a sense of powerlessness and melancholia about the environmental destruction happening around them. A study conducted in Central Appalachian areas where mountaintop-removal coal mining was taking place showed that 17% of 8591 adults surveyed suffered from major depression after the statistical control for income, education, and other risks were applied. This was compared to a 10% rate of depression among residents in non-mining areas (Hendryx & Innes-Wimsatt, 2013). Similarly, Lertzman (2015) calls this ‘environmental melancholia’ when even those who care deeply about the biosphere feel paralysed and unable to turn their concern into behaviour. In a study conducted by Lertzman (2012) individuals were often mourning a subconscious experience of loss. In this context, the attitude-behaviour gap suggests a psychological withdrawal and resignation due to a defensive state. A study conducted pre-, and post-natural disaster amongst 656 participants in Sweden found that after the natural disaster there was a decrease in their emotional relationship with a sense of place and a decline in wellbeing (Knez et al., 2018). To fully understand environmental dilemmas and the disconnection from nature, there is a need for more nuanced understandings of the affective component of the human-nature nexus (Lertzman, 2012).

2.2.3 Causes of disconnection with nature

In order to understand the human-nature nexus it is important to point out some aspects that influence disconnectedness, such as westernisation / economic development (Lovelock, 2006; Pope, 2011; Roszak, 1992; Shepard, 1982), repression (Adams, 2005; Yunt, 2001), dissociation (Swim et al., 2009),

sensory deprivation (Kaza, 1993), religion (Gifford & Nilsson, 2014; Pike et al., 2008), and individualism (Frantz, Mayer, Norton, & Rock, 2005). The causes of disconnection can be narrowed down to domination and deprivation: these are not mutually exclusive as they are self-reinforcing (the more humanity dominates nature the more deprived we become and vice-versa).

2.2.3.1 Domination

Industrialisation marks the start of anthropogenic environmental degradation (Costa & Foley, 2000; Eze, 2005; Shepard, 1982) and has since left the world suffering from 'empty world syndrome'. Before the industrial revolution, resources were relatively abundant, human settlements were few, and the human population had a limited impact on the environment. Society has not adapted its perception to a 'full world' mentality, and a distorted worldview exists based on the belief that there is room for population and economic growth without regard for the long-term impact it will have on the biosphere (Beddoe et al., 2009; Hempel, 1997).

The current economic system rewards selfishness and greed as ruling values with money perceived as the divine power that is soulless, alienating, ungodly and unnatural, yet reinforcing. The impact of this economic system on the depletion of social, cultural, natural, and spiritual capital is often veiled (Eisenstein, 2011). Poverty is a contributor to the environmental crises (ecological poverty) in that poor people, living close to the land, are putting pressure on resources because they are struggling for survival and have no other alternatives as over one-billion people are living at or near subsistence levels (Hempel, 1997). That said, environmental destruction is not a pathology of the poor only, as affluence encourages environmental damage through overconsumption and exaggerated consumer lifestyles (Dietz, Rosa, & York, 2007). The consumer culture or consumptive worldview encourages people to buy products that they don't need and don't have but promises fulfillment and happiness upon purchase, taking advantage of people who often do not know what they need to live a purposeful life (Adams, 2005). Westernisation and economic development therefore view nature anthropocentrically as a commodity for reckless use by humans (Hempel, 1997; Pollan, 2006). Commodification of trees, animals, and landscapes to manipulate consumers only adds to the distance and distortion of the human-environmental relationship (Kaza, 1993).

Anthropocentric distortion also manifests in religion. Religion encourages the belief that the earth and animals are objects to be exploited for the benefit of humankind (Lovelock, 2006). This inability of humans to see beyond their own needs links to Christian and humanist influences according to historian John Gray (Lovelock, 2006). A study conducted by Arbuckle and Konisky (2015) found that Judeo-Christians were less concerned about the biosphere than those who were non-religious. The reasons are that the Judeo-Christian belief system promotes anthropocentric and dominionistic worldviews over nature (Arbuckle & Konisky, 2015). Since [1]Axial Age religions have encouraged a systematic alienation from the earth and cosmos, but for religions to stay relevant, they need to address the environmental crises (Villasenor-Galarza, 2013) rather than further deprive followers of a healthy relationship with the biosphere.

[1] Term coined by German philosopher Karl Jaspers referring to the period 8th to the 3rd century BCE (Before Common Era).

2.2.3.2 Deprivation

Roszak (1992) argues that humans have a fundamental need to care for nature, called an ecological unconscious, and when deprived of contact with nature there is a risk of experiencing stress, anxiety, depression (Brooks, Ottley, Arbuthnott, & Sevigny, 2017; Nisbet, Zelenski, & Murphy, 2011), and even eating disorders (Riebel, 2001). According to this view, humans are depriving themselves of this inherent connection because of the dysfunctional concept of land. Aldo Leopold (1948, p. 4) said:

> *"Conservation is getting nowhere because it is incompatible with our Abrahamic concept of land. We abuse land because we regard it as a commodity belonging to us. When we see land as a community to which we belong, maybe we'll begin to use it with love and respect. There is no other way for land to survive the impact of mechanised man, nor for us to reap it from the aesthetic harvest it is capable, under science, of contributing to culture".*

This emotionally deprived relationship with the biosphere, leads to an obsession with the current moment at the expense of future human and non-human generations (Hempel, 1997). The 'tragedy of the commons' concept, developed by Garret Hardin (1968) was demonstrated empirically by stimulating the management of shared resources with the result that participants behave individually in a psychological state of deprivation, taking as much of the resources they can with the subsequent rapid depletion of the resources. This tragedy explains behaviour such as over-harvesting of trees, forfeiting long-range and bigger payoffs, and overspending on credit cards: all to obtain instant individual rewards and based on a fear of deprivation that others will use the resource first (Koger & Du Nann Winter, 2010). However, this tragedy is avoidable without top-down regulation when certain conditions are met where groups of people manage common resources sustainably and with reciprocity, using a range of design principles (Wilson, Ostrom, & Cox, 2013).

There exists a reciprocal relationship between the biosphere and individuals, where wellbeing caused by an affective relationship with nature, ultimately increases pro-environmental worldviews (Hinds & Sparks, 2009). Interestingly, Frantz et al. (2005) conducted a study which concluded that a heightened objective self-awareness decreased the emotional connection that people had with nature and that this also activated internal attitudes and traits such as exploitation and entitlement which in turn were linked to increased material consumption beyond any real need that in turn, according to Beddoe et al. (2009), reduced overall wellbeing. A study in Australia found a positive relationship between nature-based activities and the mental health and wellbeing of children (Maller & Townsend, 2006). This compares to a study that looked at the impact of television advertisements on children's eating behaviour and health. Halford, Gillespie, Brown, Pontin and Dovey (2004) found that excess sedentary activity and exposure to food cues promoted consumption, especially amongst obese children. A Swedish study done with 4703 adolescents found that obesity was associated with reduced wellbeing and that there was a significant association between obese school-aged children and depression (Sjöberg, Nilsson, & Leppert, 2005). These studies suggest that the human-nature nexus is complex and could be influenced by various indirect factors such as sedentary living and marketing impacting aspects such as mental health and behaviour. It is therefore important to aim for a broad understanding of individual's

relationships with the biosphere as domination and deprivation could emerge from, and consequently impact a range of aspects.

2.3 The South African human-nature nexus

According to the latest United Nations World Population to 2300 report (United Nations, 2004) Africa has the highest population growth rate in the world, and current rates are unsustainable. At the current rate, they state that by 2300 Africa's population will reach 115 trillion and comprise 86 per cent of the world's total population. Population growth directly accounts for three primary forms of environmental degradation namely pollution, eco-simplification (e.g., lost biodiversity), and natural resource depletion (Hempel, 1997) and based on the projections from the United Nations (2004) it is clear that we are going to overwhelm the Earth's ecological carrying capacity of ideally only a few hundred-million individuals (i.e. being the population size that can be supported without impacting the ability of other species to flourish).

South Africa ranks as one of the countries with the least environmental concern (ranked number 26 from most to least concerned) in a study of 33 countries (Franzen & Vogl, 2013). This is no surprise as the 2005 South African Social Attitudes Survey (SASAS) showed that 49.3 per cent of South Africans felt that economic growth needs more emphasis than environmental issues (Struwig, 2010). Affluent participants agreed with economic prioritisation, whereas people in informal/rural areas were more concerned with the biosphere because of their investment in ecological assets such as crops and cattle (Struwig, 2010). Anderson, Wentzel, Romani and Phillips (2010) similarly found that black African homes were more likely to acknowledge environmental issues compared to non-black African households, possibly because of their experience and understanding of the impact that environmental problems could have on the rural landscape. However, non-black African households were more aware of environmental interventions and more likely to behave pro-environmentally, possibly due to a higher level of education of the head of the household (Anderson et al., 2010).

Cognitive and behaviourally-based environmental research in South Africa is popular. A study conducted in Mamelodi, Tshwane, found that there was a willingness among residents to support environmentalism (Garg & Mashilwane, 2015). That being said, there is a lack of research conducted in South Africa on the emotional connection that individuals have with nature. However, one can draw on anthropological and theological research to support the assumption that an affective relationship with nature exists across societal boundaries and is prevalent among rural sections of society (Ramutsindela, 2008). A study by Low (2004) explored healing amongst the Khoisan and found that they use wind for healing. The Khoisan also demonstrated a deep sense of the interconnectedness between people, animals, and plants (Low, 2004). Semenya (2013) studied Pedi tribes in and around the Limpopo Province and found deeply ingrained rainmaking and rain prevention rituals and practices.

Furthermore, the awareness of the impact the destruction of nature has on human wellbeing is evident in Mpumalanga where rural communities protest for cleaner air in the coal heartland of South Africa (Siegfried, 2014). International ecopsychological research has often focused on exploring the

relationship of indigenous people with nature (Gagliano, 2013; Winkelman, 2013). We see the prevalence of this affective relationship in tribes such as the Kogi in Columbia who as part of healing nature, link invisible connections in nature with a golden thread (Reichel-Dolmatoff, 1982). There is a rich area for ecopsychological exploration among rural population groups in South Africa and the relationship they have with nature, but for practical reasons, this falls outside the scope of this thesis. However, a working assumption of the study is that most of the black middle-class is first-generation middle-class and therefore is likely to remain in close contact with their rural relatives as well as still sharing some of their cultural values and practices and therefore including them in the study could add valuable insight (Ndletyana, 2014).

A qualitative study by Lockhart (2011) in South Africa investigated whether a spiritual relationship with nature could assist in the transformation to a more sustainable country. Part of the recommendations from the study was a) for ecopsychology to play a more significant role within sustainable development discourse/communication and, b) for more research to be conducted regarding the relationship that individuals have with nature and the implications for sustainability. Although some research has been conducted in South Africa, there is a lack of exploration of individual differences when it comes to the human-nature nexus and there is a dearth of locally relevant ecopsychological theory. Nuanced understandings of individuals and their relationship with the biosphere are an important aspect of communicating in a way that resonates with different individuals, rather than using linear thinking such as that spirituality alone increases sustainable behaviour. The following section looks at common intervention strategies and shows the importance of being able to communicate on an individual or micro level when it comes to environmental issues.

2.4 Intervention approaches

Behavioural interventions are the most empirically studied intervention type when it comes to pro-environmental behaviour (Lehman & Geller, 2004). Most commonly, behavioural intervention strategies use an ABC (antecedent-behaviour-consequence) model favoured by environmentalists. The model works on the principle that behaviours are directed by antecedent stimuli that preceded them and this suggests the availability of positive or negative consequences. Dwyer, Leeming, Cobern, Porter and Jackson (1993) compared 54 environmental-preservation studies published during the 1980s and found that both antecedent (written information, group/personal goals, competition) and consequence strategies (penalties, rewards) showed efficacy in encouraging or producing behavioural change, but not necessarily in maintaining behavioural change. An example of an antecedent strategy is psycho-educational interventions that provide information and promote awareness of an environmental problem with the aim of changing behaviour but shows little or no impact on behaviour (Geller, 1992; McKenzie-Mohr, 2000). The possible reason is that when short-term reinforcers are more salient than long-term costs, the tragedy of the commons comes into play (Hardin, 1968). An example of a consequence strategy is rewards that might initially lead to a change in behaviour, but those changes often disappear once the reward is removed (Dwyer et al., 1993).

The efficacy of behavioural interventions is impacted by factors relating to focus, strategy and insight. Lehman and Geller (2004) state that behavioural interventions do not focus on critical environmental issues since they focus on issues such as increasing recycling behaviour, decreasing residential energy use and reducing litter. There is also an argument to be made that the superimposed focus on certain behaviours might mean that there is a disconnect between aspects important to the target market that might not align with the behaviour targeted for the intervention. Additionally, interventions are often directed at behaviour post-consumption rather than pre-consumption, where it is likely to have the most impact. For example, research has found that animal-based diets require more energy, land, and water resources compared to a plant-based diet, and therefore the latter has reduced carbon loadings and is consequently more sustainable (Baroni, Cenci, Tettamanti, & Berati, 2006; Eshel & Martin, 2006; Pimentel & Pimentel, 2003): therefore targeting pre-consumption beliefs and attitudes might impact consumption choices. The lack of long-term success of behavioural strategies suggests that there is an opportunity to understand the underlying psychological processes that motivate behaviour in order to design interventions that target the psyche and impact behaviour. According to Glaeser (2014) the process for effective behavioural interventions starts with building empathy and then providing information about how certain behaviour is negatively impactful.

Social psychological approaches play an important role in understanding the collective basis of pro-environmental behaviour (Salazar, Oerlemans, & Van Stroe-Biezen, 2013; Stephens, Willis, & Walker, 2007). Salazar et al. (2013) investigated whether social influences have an impact on whether people choose environmentally friendly products. They found that the closer the social group, the more noticeable the effect it has on the decision making of the individual and that females were more sensitive to information received from their social groups. Additionally, they found that social learning is more effective in generating a structural change in behaviour compared to herd behaviour. This addresses the issue of a limited duration of pro-environmental behaviour and the generalisation from targeted to non-targeted behaviours. Staats, Harland and Wilke (2004) used a combination of information, feedback, and social groups to assess the impact these interventions would have on household environmental behaviour. Over three years they found that participants changed half of 38 household behaviours tested and two years after the study a 7 per cent saving on water consumption and a 32 per cent reduction on waste generation was still prevalent. McKenzie-Mohr (2000) used community-based social marketing to address environmental behaviour through carefully selecting the activity to be promoted, identifying barriers to the action and then piloting a strategy before launch. Using this approach, he found an increase in efficient water usage in one study and in another study he noted an increase in purchases of products with recycled content. Although social psychological approaches provide a strategy for interventions in contexts where collectivism is important, it might not be effective when dealing with communities or people where individualism shapes beliefs (McCarty & Shrum, 2001).

Other critical intervention approaches are cognitive, ecopsychological, and neo-analytic approaches. Cognitive approaches suggest that to foster pro-environmental behaviour one needs to change the perceptions and thoughts people hold about environmental issues and the environment. Unless people can see the impact of environmentally destructive behaviour, they are unlikely to notice the contributing behaviours, and therefore abstract problems such as global warming go unnoticed (Du Nann Winter,

2000). This is where ecopsychological approaches are well suited as they work on the restoration of the affective relationship between people and the biosphere to encourage change. Waage, Paisley and Gookin (2012) found that wilderness experiences have a positive cognitive and emotional impact on environmental ethics. Similarly, the David Suzuki Foundation began a program in 2012 encouraging Canadians to spend 30 minutes per day in nature during May and found significant wellbeing benefits (Capaldi, Passmore, Nisbet, Zelenski, & Dopko, 2015). This benefit has been well demonstrated in various contexts with a range of individuals (Bettmann, Russell, & Parry, 2013; Cameron-Faulkner, Melville, & Gattis, 2018; Chalquist, 2009; Dopko, Capaldi, & Zelenski, 2019; Duvall & Kaplan, 2014; Edgmon, 2001; Hinds & Sparks, 2009; Kamitsis & Francis, 2013; Maller, Townsend, Pryor, Brown, & St Leger, 2005; Nisbet et al., 2011; Pasanen, Ojala, Tyrväinen, & Korpela, 2018; Pryor, Carpenter, & Townsend, 2005; Russell, 2000; Ryan, Weinstein, Bernstein, Brown, Mistretta, & Gagné, 2010; Westlund, 2015) suggesting the ability of these approaches to influence perceptions about the biosphere. Additionally, exploring neo-analytic approaches to sustainability is useful as it views human alienation from the biosphere and the environmental crisis as a function of mostly unconscious, instinctually-driven behaviours (Du Nann Winter, 2000). Kanner and Gomes (1995) explored object relations theory in this light that stated that humans have a profoundly innate ecological identity that has been repressed by the urban-industrial culture. Due to the loss of this biophilic identity, marketing can convince people that their lost identity is in material products and therefore neo-analytic approaches focus on a deeper connection between the individual's sense of self and the biosphere. Although cognitive, ecopsychological, and neo-analytic approaches have shown some success, they lack an approach that forms strategies based on individual differences in the human-nature nexus.

Identity- or micro-campaigning is another way to address environmental issues. It is an intervention method that uses individual similarities and differences through the development of typologies, segments or personas (Carey, White, McMahon, & O'Sullivan, 2019; Corner et al., 2014; Crompton & Kasser, 2009) for sustainability-targeted strategies. To successfully address environmental problems, individual differences need to be understood to effectively address their reasons for action or inaction (Crompton & Kasser, 2009; Leiserowitz et al., 2009). Currently, campaigns, policy development, or sustainable product development tend to focus on those people who already have a biospheric or self-transcendent worldview but not on other types of people, and therefore strategies have become polarised (Corner et al., 2014). A sustainable product design study found that personas or typologies was a pragmatic approach to develop relevant sustainable design products (Carey et al., 2019). According to Milfont and Sibley (2012) interventions aimed at addressing climate change need to approach the problem on multiple levels. By understanding individual differences through typologies, interventions can be more targeted and therefore more inclusive and effective. To build micro-campaigns, individual differences, when it comes to the affective relationship with the biosphere, need to be understood.

2.5 Typologies

The field of ecopsychology argues that understanding the affective relationship that people have with the biosphere is important for addressing the environmental crisis (Roszak, 1992). However, current

linear and limited typologies (that is to say using uni-dimensional variables and/or a methodology with no regard for the fact that humans are systems) are inadequate (Ingulli & Lindbloom, 2013) because they lack an exploratory understanding of the affective relationship that people have with the biosphere as well as what experiences and stories are likely to shape pro-environmental behaviour or concern (Kollmuss & Agyeman, 2002). Typologies are ubiquitous (McKinney, 1969) and an effective way for understanding relationships that individuals have (Merlino, 2014) within the framework of complexity found in systems (Doty & Glick, 1994; Mandara, 2003). When typologies are meaningful and theoretically formed, they can provide valuable points of departure for interventions such as identity-campaigning, focused communication strategies, and targeted policy-making.

2.5.1 Typologies to understand complexity

Phenomena such as the human-nature nexus can be complex to understand since a range of variables could influence them. To make sense of this complexity, McKinney (1969) suggests using a process of reduction through conceptualisation. Typologies reduce complexity in the empirical realm by using the min-max rule to construct a minimum number of types, where each demonstrates a maximum amount of homogeneity (Bailey, 1973; Mandara, 2003). Furthermore, typologies incorporate the multidimensionality of human nature, taking into consideration interactions between various human characteristics (Fiss, 2011). Therefore, typologies stretch beyond traditional linear models of causality; they allow for the exploration of multiple relationships between variables; they can account for levels of causal complexity and can function as a shorthand device for cognitive simplification of a complex individual within a systems orientation (Doty & Glick, 1994).

Typologies can be constructed on a micro (individual) or macro (cultural) level (McKinney, 1969). A cultural theory developed by Mary Douglas (Douglas & Wildavsky, 1982) describes people as reacting to perceived risk based on social aspects and cultural adherence (Oltedal, Moen, Klempe, & Rundmo, 2004). Their perceived risk is also influenced by their attitudes towards nature (Thompson, 1980). Cultural theory (Douglas & Wildavsky, 1982) describes four typologies, namely *Individualistic* (nature is benevolent and full of potential), *Egalitarian* (nature is fragile), *Hierarchical* (nature is perverse/tolerant) and *Fatalistic* (nature is unpredictable) (Oltedal et al., 2004). Although popular, cultural theory has some shortcomings, namely that it lacks empirical substantiation, it ignores the complexity inherent in social groups, it provides a superficial exposition of human motivations, and leaves no room for new information or new interpretations (Boholm, 1996). Typologies have also been used extensively in many fields to understand individual complexity (Merlino, 2014). Some fields in which typologies are used are organisational psychology (Fiss, 2011; Kitay & Marchington, 1996; Shuey, 1937; Yahyagil, 2015), green consumerism (Dansirichaisawat & Suwunnamek, 2014; Finisterra do Paco & Raposa, 2010; Gil, Gracia, & Sanchez, 2001; Straughan & Roberts, 1999), climate change driven population movements (Stojanov et al., 2014), climate change strategies (Kolk & Pinkse, 2004), sports consumerism (Stewart, Smith, & Nicholson, 2003), risk perception (Oltedal et al., 2004), and in the environmental movement. Environmental typologies are useful to understand public perceptions to determine how individuals react to issues such as climate change (Metag et al., 2017) and these models are also able to inform micro-communication campaigns for behaviour change initiatives (Poortinga & Darnton, 2016).

Although there is no formal standardisation about what components must be assessed in order to build a typology, some guidelines exist. Each variable in the study should have equal potential to be a clustering or profiling variable (McKelvey, 1975). Rigor needs to be used for the formation of creative concepts, there needs to be a hierarchical structure of concepts with an overarching concept that contains dimensions with visuals making categories and dimensions explicit (Collier, Laporte, & Seawright, 2012). The typologies need to include salient elements related to the phenomenon under investigation and each feature needs to be shared by many participants and each participant needs to possess many features (Bailey, 1973). Typologies need to be interpretable (Bailey, 1973) and be able to explain complex social realities (Kluge, 2000). Typologies also need to be homogeneous (McKelvey, 1975) with maximal deviation between types (Bailey, 1973).

Both individual and cultural theory use typologies as organised systems of types (Collier, Laporte, & Seawright, 2008) that explore relationships and allow for theory building (Doty & Glick, 1994). Identifying logical arguments that describe the relationships amongst concepts, constructs, and variables builds typological theory (Doty & Glick, 1994; McKinney, 1969). Doty and Glick (1994) describe three criteria for a typology to be a theory; namely that constructs need to emerge, relationships between constructs need to be explained, and these relationships need to be falsifiable. Although all typologies make complexity coherent, form systems, and allow for theory building, not all typologies are built in the same way.

2.5.2 Building typologies

There are different types of typologies; namely monothetic typologies and polythetic typologies (Bailey, 1973). Monothetic typologies are where it is necessary for each feature to be present for membership to a type. Polythetic typologies can be formed using a range of combinations of features and are considered a superior form of typological construction for research. The elements which make polythetic types the preferred typology type are: that they ensure parsimony, allow for variation in the empirical world, no unique set of defining features is required, no single element is essential for membership, and that there exists the ability to reduce the number of types by using pragmatic reduction (Bailey, 1973). McKinney (1969) describes two other types namely existential and constructed, based on who is building the typologies. Existential types are those that are created by participants themselves in social systems, whereas constructed types are created by a researcher to increase understanding of systems. Collier et al. (2008) differentiate between descriptive and explanatory typologies. Within the context of this study it is intended to build constructed polythetic typologies that are explanatory.

Building typologies requires an empirically rigorous method to bridge the nomothetic-idiographic gap (Mandara, 2003; Shuey, 1937). The idiographic gap maintains that all individuals are unique and should be studied phenomenologically versus a nomothetic approach that aims to generalise to build theory (Mandara, 2003). The process of constant compression and expansion (Elman, 2005) seeks to address the gap by reducing the complex to the straightforward, unique to general, and occurrent to recurrent (McKinney, 1969). Compression and expansion lead to abstract generality through the reduction and

exclusion of objects that do not explain types (McKinney, 1969). Compression is the process of collapsing codes or categories that individually do not serve the emerging theory (Elman, 2005). Expansion is a process of rediscovery through the emergence of essential explanatory elements included in the construction of theory (Elman, 2005). After this continuous process, typologies should be able to identify, organise, and describe patterns without sacrificing the wholeness of individuals that make up the typology (Mandara, 2003). Furthermore, a typology should describe the phenomenon investigated (Fiss, 2011), use vivid type labels (Collier et al., 2008), and be careful that the intuitive simplicity of a type does not mask significant complexities that exist (Doty & Glick, 1994).

Although typologies are robust (Elman, 2005) they are based on the assumption that there exists some order amongst phenomena that might not always be the case (McKinney, 1969). Another risk inherent in typology building is giving typologies labels that veil the underlying complexity (Elman, 2005) versus others that are too simplistic and exclude key processes (Doty & Glick, 1994). However, Shuey (1937) argues it is possible that some individuals do not represent clear types but a mixture of types and this changes depending on the situation the individual finds themselves, posing a significant risk for typology building. These risks can be reduced by ensuring that the purpose of the typology drives its development and the selelction of variables. A typological study that aims to understand the human-nature nexus should include variables related to the main phenomenon (Pacini et al., 2014), should choose variables that are focussed on answering the research questions, the variables should shape or influence the human-nature nexus and the selected variables should aim to provide a cluster solution that has explanatory value and is conceptually meaningful (Alvarez, Paas, Descheemaeker, Tittonell, & Groot, 2014). The following section explores individual constructs and variables selected for the typology building.

2.5.3 Individual constructs to understand the human-nature nexus

A multi-structural framework is useful for identifying individual differences to build typologies that explain their relationship with the biosphere. Individual constructs (De Witt & Hedlund, 2013; Koltko-Rivera, 2004) are helpful to understand the human-nature nexus: intrinsic (Gifford & Nilsson, 2014; Pidgeon, 2014; Sabini, 2008; Schwartz, 2009), cognitive (Dunlap, 2008; Lewis, 2009; Schultz et al., 2004; Swim et al., 2009; Tauber, 2012), affective (Beery & Wolf-Watz, 2014; Ojala, 2012; Roszak, 1992; Semenya, 2019), and behavioural (Berndt & Gikonya, 2012; Herzog et al., 2005; OECD, 2008; Zarepour, 2012). The intrinsic construct includes stable and to some extent unconscious individual traits that include an individual's values (LeBaron, 2003) and personality (Krajhanzl, 2010). The cognitive construct includes worldviews (Lacroix & Gifford, 2018) and issues that individuals perceive as important (World Economic Forum, 2014). The affective construct seeks to understand how the individual feels about nature and the extent of their sense of the natural world (Mayer & Frantz, 2004). For some, this affective component could include a feeling that the natural world is something "out there" and in which humans have no part. This position relates to concepts such as sensory shutdown, hyper-reflexivity, objectification, normotic illness, and self-exile (Puhakka, 2014), or the paranoid-schizoid position (Baker, 2013). Although understanding the affective connection to nature is in no way a binary approach, the other side of the spectrum could be called intimacy, intersubjectivity, or the porous self-other boundary (Herbert, 2014).

Lastly, the behavioural construct allows for understanding the behavioural trends of the individual in as much as how they claim to be living daily (Defra, 2008). Currently, there is a lack of systematic coherence between the fields of psychology, ecology, and ecopsychology when it comes to treating individuals as complex typological systems and attempting to understand their interrelationships with nature using various constructs while building theory. The following sections aim to examine each construct in more depth.

2.5.3.1 Intrinsic construct

The three identified dimensions that make up the intrinsic constructs for this study are demographics, personality, and values. Demographics, such as gender (Hunter, Hatch, & Johnson, 2004) and years of education, have been shown to impact pro-environmental behaviour (Kollmuss & Agyeman, 2002), but demographics alone cannot explain environmental beliefs and motivations. Personality and values that are mostly stable over the individual's life are important to consider when making sense of the individuals' worldview and experiences because they play an important role in shaping beliefs and attitudes and are often important predictors of environmental engagement (Markowitz et al., 2012; Milfont & Sibley, 2012). Although important predictors, they need to be combined with other variables in order to explore potential mediating factors (Hirsh, 2010). Values are often a mediating factor since they are rarely directly correlated to behaviour (Kennedy, Beckley, McFarlane, & Nadeau, 2009), but they provide a better understanding of the individual's intrinsic motivations (Klöckner, 2013). The following section describes the demographic, personality and value dimensions that form the intrinsic construct of the study.

2.5.3.1.1 Demographic dimension

Demographics and their role in understanding the human-nature nexus are complex. Diamantopoulos Schlegelmilch, Sinkovics, and Bohlen (2003) found that socio-demographics are a poor predictor of environmental consciousness. However, in a study conducted by Berndt and Gikonyo (2012) in South Africa, Zimbabwe, Zambia, and Kenya (N = 450) they found significant differences between respondents younger than 20 and older participants when it comes to environmentally friendly purchasing behaviour. They found no differences between genders in respect to purchasing behaviour (Berndt & Gikonyo, 2012), unlike the study of Gifford and Nilsson (2014) which found women to have stronger environmental attitudes, concern, and behaviour compared to men. According to Gifford and Nilsson (2014) highly educated people tend to be more concerned about the environment, younger people more concerned than older people, and older people were more likely to engage in pro-environmental behaviour. Increased ecological engagement amongst older people is attributed to greater environmental knowledge (Otto & Kaiser, 2014). Religion has also been found to influence environmental worldviews (Gifford & Nilsson, 2014). A study conducted by Arbuckle and Konisky (2015) found that Judeo-Christians tend to be less concerned about environmental protection than those who are non-religious. A South African study (Struwig, 2010) found a significant difference between environmental concern and race with African respondents being the least concerned about the environment, followed by mixed, indian and white respondents. Additionally, those with higher education showed the most concern for

the environment, and there were no gender differences, religious differences, or age differences regarding environmental concern (Struwig, 2010).

Although demographics are able to provide partial insight into intrinsic differences between individuals, they cannot be used in isolation as a determinant of the human-nature nexus because they are unreliable and unstable predictors, as can be seen from the inconclusive research findings. The human-nature nexus is potentially influenced by more than just demographics. Therefore, demographics alone would risk simplifying the complexity inherent in the human-nature nexus while including additional variables has the opportunity to provide deeper insight as to the individual relationship with the biosphere.

2.5.3.1.2 Personality dimension

Personality, as an intrinsic construct, plays an important role in how a person relates to and interprets the world (Hurst, Dittmar, Bond, & Kasser, 2013). Moller (1995) describes personality as that which makes every human being unique; it is the structure and combination of behavioural patterns; it refers to thoughts and emotions that differentiate people from one another; personality is a tool for adjustment to the environment and life experiences; and personality refers to the dynamic nature of a person and explains the consistent and predictable reactions of a person across situations and over time. Bjorkqvist, Bergbom and Holm (1994) suggest that there is a circular relationship between personality and worldviews, with personality influencing worldview choice, and worldviews in turn impacting personality structure.

Personality can assist in understanding environmental views and engagement (Milfont & Sibley, 2012). Wiseman and Bogner (2003) found a correlation between psychotic personality traits and an anthropocentric worldview as well as a correlation between the personality trait of neuroticism and a biocentric worldview. Furthermore, masculine personality traits such as independence, strength, aggression, hardiness and non-emotionality could impact negatively on the degree to which an individual feels connected to nature (Kanner & Gomes, 1995). Hirsh (2010) found the personality traits of agreeableness and openness to strongly correlate with environmental concern and these traits have been found to be more prevalent in women (Morton, Tyran, & Wengström, 2011). The relationship between agreeableness and environmental concern has been said to be a consequence of an overall pro-social orientation in individuals (Kaiser & Byrka, 2011). Furthermore, when it comes to specific environmental issues such as climate change, individuals tend to seek and remember information that is consistent with their ideology, and personality traits shape these ideologies whether hierarchical and/or authoritarian (Stanley & Wilson, 2019)

Personality is therefore an important determinant to consider when exploring the human-nature nexus since concern and behaviour do not provide a full picture of the underlying psychological process that influences nature relatedness (Hall et al., 2018). Personality provides a platform for explaining how individuals form beliefs and attitudes (Poškus & Žukauskienė, 2017) and how they respond to trauma and risk (Marais & Stuart, 2005) that ultimately impacts their behaviour. Furthermore, personality can

enhance the understanding of typological differences in values (Kajonius, Persson, & Jonason, 2015) that provides an extensive and more nuanced understanding of the human-nature nexus. Therefore, in order to develop meaningful typologies that allow a deeper understanding of climate change risk response and relationship with the biosphere, personality should be included.

2.5.3.1.3 Values dimension

Values function as systems rather than as an aspect in isolation. In this system some values are allocated higher importance than others and that then influences behaviour. Schwartz (2006, 2009) states that value priorities emerge out of adaptation to life experiences and are important because they form a system of priorities that steer, influence, and are influenced by cognition, affect, and behaviour. Value theory specifies six main features of values, namely that: values are beliefs that are linked to affect, they refer to goals that motivate behaviour, values surpass specific actions and situations, values serve as guidelines which are rarely conscious, values are arranged by importance and form part of a hierarchical system, and the relative importance of multiple values determine action (Schwartz, 2006).

Individuals are more likely to protect things that they value because values are motivational constructs (Schwartz, 2009; Stern & Dietz, 1994). They impact how people interpret situations, how and what kind of information they seek out, the choices they make, and are powerful in guiding human behaviour (Hahnel, Ortmann, Korcaj, & Spada, 2014; Schwartz, 2009). Materialistic values are negatively correlated with pro-environmental attitudes, beliefs, behaviour (Hurst et al., 2013; Kilbourne & Pickett, 2008), and wellbeing (Brown & Kasser, 2005; Dittmar, Bond, Hurst, & Kasser, 2014). Corner et al. (2014) found that self-transcendent values were congruent with environmental concern. Stern, Dietz and Kalof (1993) suggested in their study on value orientations and environmental concern that women interact more with environmental issues than men because of their ability to link environmental conditions and their values, rather than that they have different values to men.

Although many studies (Bardi & Schwartz, 2003; Dietz, Kalof, & Stern, 2002; Hansla, Gamble, Juliusson, & Gärling, 2008; McFarlane & Boxall, 2000; Raudsepp, 2001; Schultz & Zelezny, 1998) have investigated the role of values in understanding elements of the human-nature nexus, there is a need for including values in a broader study that involves various constructs and methods for a more in-depth understanding of the complexity inherent in human affect, behaviour, and cognition related to the biosphere. Values are able to provide insight, but not necessarily provide a full understanding of the complexity inherent in the human-nature nexus.

2.5.3.2 Cognitive construct

Cognition is the mental process of knowing, awareness, perception, reason, and judging (Brandimonte, Bruno, & Collina, 2006) and provides an important glimpse into the internal world of individuals and how this internal world operates when it comes to the biosphere. This study included the cognitive constructs of worldviews, attitudes, and concern. Although people think they are concerned about certain issues, it does not necessarily translate into behaviour or affect and vice versa (Straughan & Roberts, 1999), and therefore including cognitive constructs are important to allow for a fuller typological understanding.

Worldviews are able to provide contextual structure for the expression of individual attitudes and concerns (Hergenhahn, 1997). Consequently, including specific attitudes and concerns provides a deeper understanding of the expression of worldviews and how that impacts the human-nature nexus. There are typically three types of environmental concern: egoistic, altruistic, and biospheric (Ojala, 2012; Schultz, 2001) which can be mediated by worldviews, but specific concerns and attitudes can only be present in the context of awareness. Therefore, to understand the overarching worldview and then how that relates to awareness, concerns and attitudes towards specific issues (such as canned lion hunting) will provide a nuanced understanding of individuals. Worldviews mostly operate subconsciously, but attitudes and concerns towards specific issues operate more consciously providing a fuller understanding. The following section describes the worldviews, awareness, attitudes and concern dimensions that form the cognitive construct of the study.

2.5.3.2.1 Worldviews dimension

Worldviews are complex and represent an individual's inner experience of the outer world, which is innate, learned, adopted, and to a large extent unconscious (Koltko-Rivera, 2004; Nilsson, 2013). Hergenhahn (1997) defines worldviews as a system of meaning and meaning-making that informs how humans interpret, enact, and co-create reality. Worldviews are not necessarily rational or accurate but have the ability to influence behaviour (De Witt & Hedlund, 2013; Lewis, 2009). Worldviews can also be described through the lenses of human nature, culture, and personality (Nilsson, 2013).

Worldviews relating to environmental views can be understood using a continuum. On the one side exists the Dominant Social Paradigm (DSP) characterised by anthropocentrism that features humans as separate and dominating over nature (Dunlap, Van Liere, Mertig, & Jones, 2000; Kilbourne & Polonsky, 2005). Lewis (2009) found that when the DSP is combined with the belief in technology, environmentally responsible behaviour declines, showing a potential link between worldviews and the human-nature nexus. On the other side of the worldview continuum is the Ecological Paradigm (EP) that is characterised by a compassionate view of the earth (Dunlap & Van Liere, 1978) and acknowledgement of interconnectedness between individuals and nature (Schultz et al., 2004). Putnam (2006) proposed an Environmental Paradigm Shift (EPS) hypothesis, which suggests that experiences during childhood (e.g. gardening with a grandmother, playing in the woods, etc.) or adult experiences (e.g. intellectual experiences, substance-induced experiences, and traumatic experiences such as seeing an animal die after drinking from a neighborhood stream) could make an individual switch dramatically from the DSP to the EP. Hedlund-de Witt, De Boer and Boersema (2014) found that worldviews that emerge from an intrinsic motivation (behaviour that is done for its own sake) are more positively correlated with pro-environmental attitudes and behaviours compared to worldviews that are extrinsically oriented (external motivations for activities).

Therefore, worldviews are able to provide insight into underlying motivations for beliefs, attitudes and behaviours, but fail to include or consider awareness, concerns and attitudes relating to specific issues. Investigating these aspects provides a fuller picture of elements that impact the human-nature nexus and the specific environmental issues that emerge as emotional and cognitive triggers for individuals.

2.5.3.2.2 Environmental awareness, concerns and attitudes dimension

Environmental awareness, attitudes and concern refers to the extent that individuals are cognitively aware and / or concerned about environmental issues (Dunlap & Jones, 2002; Stern et al., 1993). Although concern can determine willingness to behave pro-environmentally (Dunlap & Jones, 2003), understanding the underlying motivations and boundaries of concern is challenging because the construct is complex to operationalise (Dunlap & Jones, 2002). Grieve and Van Staden (1985) suggested that in South Africa liberal views correlate strongly with pro-environmental attitudes whereas Diekmann and Franzen (1999) state that wealthier individuals demand higher environmental quality therefore they have higher concern than their poorer peers. Meanwhile, Dunlap (1994) mention there is no difference between wealthy and poor when it comes to attitudes towards the environment. The inconsistency in understanding indicates a need for a deeper understanding of what drives environmental concerns, relatedness and issues such as environmental apathy.

Research aimed at understanding the complexity of environmental concern has received limited focus in South Africa. A study of 240 households in Northeast South Africa found that environmental concern was associated with material issues in areas with resource scarcity (Hunter, Strife, & Twine, 2010). Another study, conducted in seven African countries, including South Africa, and eleven developed countries, found that individuals who feel that they are part of the working class, lower-, upper-middle and upper-class were more willing to make financial sacrifices to counter environmental pollution compared to those who see themselves in the lower class (Sulemana, James, & Valdivia, 2016). Many studies focus on the relationship between concern, beliefs, and values. One such study was conducted in Sweden with individuals aged 18-69 and showed that egoistic beliefs and concern are related to power values, social-altruistic beliefs and concerns are related to benevolence and that biospheric beliefs and concerns are related to universalism values (Hansla et al., 2008). Similarly, Schultz et al. (2005) found a positive correlation between environmental concern and self-transcendence values and a negative correlation between environmental concern and self-enhancement values. According to Kilbourne and Pickett (2008) materialism negatively impacts environmental beliefs.

There is a scarcity of information about what types of people in South Africa are concerned about what type of environmental issues. Considering environmental problems ranging from canned lion hunting to air pollution, it is important to understand differences in concerns to provide nuanced insights when it comes to advocacy, micro campaigning, and policy strategy. It is also imperative to relate these emerging concerns with associated affect in order to determine motivation and strength of the concern under investigation.

2.5.3.3 Affective construct

Emotions are a source of information and can determine why some people are apathetic and why others are concerned about environmental issues (Norgaard, 2006). Therefore, affect describes the emotional relationship individuals have with the biosphere and an understanding of feelings of love and hate (Brown, 1995). Beery and Wolf-Watz (2014) define environmental connectedness as an affective, cognitive, and/or physical human relationship with nature described using terms such as nature affinity,

biophilia, commitment, ecological-self or ecological-identity, inclusion, relatedness, and sensitivity towards nature. Herbert (2014) describes connection to nature as an element of intersubjectivity where there is a lack of boundary between the person and the biosphere. Although there are studies that explore relationship to nature (Capaldi, Dopko, & Zelenski, 2014; Clayton, Luebke, Saunders, Matiasek, & Grajal, 2013) and various psychometric measures (Frantz et al., 2005; Perkins, 2010), one existing gap is the exploration of different types of "connection to nature".

Understanding affect towards nature allows for a movement away from specific superficial issues (like changing light bulbs) towards a deeper understanding of the underlying emotional processes that impact lifestyle patterns and ecological behaviour (Mayer & Frantz, 2004). Affect can be expressed as intimacy (Herbert, 2014; Martin, 2004; Puhakka, 2014; Silvia, 2002; Winkelman, 2013), empathy (Batson et al., 1997; Kals, Schumacher, & Montada, 1999; Schultz, 2001; Tam, 2013), recreational and theological engagement (Capra, 1996; Hoffman & Sandelands, 2005; Tam, 2013), apathy (Louv, 2012; Schultz, 2001; Simms, 2014), alienation (Frantz et al., 2005; Martin, 2004; Puhakka, 2014; Stone, 2014), and ambivalence (Baker, 2013; Jordan, 2009; Randall, 2005; Van Vugt, Griskevicius, & Schultz, 2014; Winnicott, 1953). There is a gap in research since different types of people might have different types of these affective relationships with nature, and a range of constructs, not currently considered systemically, could influence these types of affective relationships.

Traditional religious worldviews (Hedlund-de Witt et al., 2014) and objective self-awareness are related to lower affect toward nature (Frantz et al., 2005) whereas higher affect toward nature shows a higher likelihood for pro-environmental behaviour (Mackay & Schmitt, 2019). A study of 141 farmers in Australia showed that a higher affective connectedness to nature was related to vegetation protection (Gosling & Williams, 2010). Furthermore, a study conducted by Barbaro and Pickett (2016) on the relationship between affective connectedness to nature and mindfulness and pro-environmental behaviour found mindfulness deepened affective experiences with nature. This relates to a study conducted by Howell, Dopko, Passmore and Buro (2011) that found a significant relationship between positive affect towards nature and wellbeing amongst a sample of 452 psychology students. Whereas anthropomorphising nature as a female increases feelings of affect towards nature and pro-environmental intentions (Liu et al., 2019), watching nature documentaries does nothing to strengthen the affective relationship with nature (Arendt & Matthes, 2016). Biospheric values have been found to strongly relate to a stronger positive emotional relationship with nature (Martin & Czellar, 2017; Mikolajczak, 2019).

It is important to understand how individual relationships to nature form and how affective, intrinsic, cognitive and behavioural constructs shape how this affective relationship is expressed. However, developing countries are poorly represented in the affective understanding of connectedness to nature literature and research (Restall & Contrad, 2015). According to Andrews (2017) the human-nature nexus in South Africa is plagued with issues of class, race, and gender. Reformist ideas to overcome the legacy of apartheid have aided in perpetuating the ecological crisis after the end of apartheid, with capitalist ideologies and behaviours increasing unrestrained exploitation of natural resources in industries such as mining and fishing, suggesting a lack of positive affect towards the biosphere. Typologies that include affect towards nature have not been researched before and neither have types of affective relationships

with nature. One can imagine that there might be differences between the affect farmers feel compared to the affect experienced by a wilderness guide.

2.5.3.4 Behavioural construct

According to Shuey (1937), behaviour is not an adequate form of typology on its own and building typologies based on behaviour alone is less reliable than when using psychographics (Straughan & Roberts, 1999). However, understanding behaviour as part of a system is valuable because the way individuals feel towards the biosphere is potentially indicative of the meaning and value it has for them and that might impact behaviours. Getting people to change certain individual behaviours has the potential for highly positive impacts on the biosphere since the consumption of food, energy, water, transport and waste production are major contributors to greenhouse emissions with food consumption alone contributing about 50% (OECD, 2008; Zarepour, 2012). Kim (2002) states that household consumption contributes to 72% of overall greenhouse gases and that individual consumption preferences shape the demand for products that impact pollution. Although Europe, the USA and China are currently the top contributors to greenhouse emissions (Olivier, Janssens-Maenhout, Muntean, & Peters, 2013), the impact of developing countries is likely to increase as the middle class grows and there are demographic and lifestyle changes (OECD, 2002). The collective emissions of developing countries are projected to increase by 84% and by 2025 will make up 55% of all global emissions (Herzog et al., 2005). In order to address future behavioural trends it is valuable to understand how current claimed behaviours relate to individual affect, worldviews, values, awareness, concern and attitudes since behaviour is an outcome of these psychological processes.

Behavioural problems are often interconnected, with increased consumption leading to increased waste. According to Muzenda (2014) the increased standard of living of South Africans has increased the waste problems in South Africa, which is a growing environmental concern. According to Muzenda's research the top contributors to waste generation in South Africa are Gauteng (45%) and the Western Cape (20%) followed by Mpumalanga (10%). According to Eneh and Oluigbo (2012) recycling behaviour reduces the use of virgin resources, reduces the need for landfill sites, controls emissions, decreases human health concerns, saves natural habitats and biodiversity, reduces energy consumption, leads to a reduction in air and water pollution, and could create jobs. Transport is the second biggest contributor to carbon emissions in South Africa and a complex element to address with growing middle class aspirations, lack of clean energy alternatives, and poor public transport options (Jennings & Covary, 2007). Energy and water use is intricately linked to climate change. According to a report by the IPCC (2007) global primary energy demand is estimated to increase by over 50% by 2030 and additionally, freshwater withdrawals are predicted to increase by 50% in developing countries by 2025. Lastly, the purchase and consumption of animal-based foods contribute to carbon emissions, which destroys biodiversity and requires more energy, land, and water resources compared to a plant-based diet and therefore the latter has reduced carbon loadings and is more sustainable (Baroni et al., 2006; Pimentel & Pimentel, 2003). There is an opportunity to understand which behaviours might be easier to target based on individual differences.

Behaviour is impacted by constructs such as knowledge, internal locus of control, personality, accountability, and threats to health (Fransson & Gärling, 1999). Therefore, researching differences in behaviour alone does not provide the full picture as in the case where those who least believe in climate change showed the most pro-environmental behaviour (Hall et al., 2018). It is also important to understand how behaviour relates to affect towards the biosphere and consequently, to change certain individual behaviours and what psychological processes need to be taken into consideration. Therefore, it is important to understand behaviour in the context of a broader and more detailed typological exploration.

2.5.4 Typological landscape

Based on the individual constructs (as described in the above section) that might impact the relationship that individuals have with the biosphere a sample of existing typologies were reviewed based on their inclusion of either intrinsic dimensions (demographics, personality, values), cognitive aspects (worldviews, environmental awareness, concern and attitudes), affective dimensions (connectedness to nature or emotional positionality), or behavioural dimensions (behaviour). These four constructs and associated dimensions were selected, as discussed, based on their ability to explain the human-nature nexus, their potential to collectively answer the research questions, their strength to build typological theory and ability to be measured for clustering.

Typologies were reviewed (table 3) based on their inclusion of the individual constructs and dimensions abbreviated in Table 2. The sample of typologies selected for review ranged between different fields (i.e. climate change versus eco-tourism), sample (e.g. students versus farmers), and aimed to explore mainly emergent typologies with a few that were duplicated typologies. The typologies that were reviewed were not exhaustive in that duplicate typologies, and similar studies with no new information were excluded. There is inconsistency in wording in the field of psychology and therefore studies that do not use the words typology, persona, or segment might have been overlooked. The aim was also to obtain a temporal range of typology development and synthesise a handful of different typologies to ascertain trends in the environment-related typological field.

In fields such as green marketing, where there are large amounts of typology work, only a few were selected for comparative purposes, and typologies with low or no environmental focus were excluded. Where authors replicated typologies only one article was reviewed to avoid duplication. This review was interested in typologies formed to describe the individual relationship to climate change/global warming, positionality typologies that in some way look at the relationship between individuals and an aspect of nature, biodiversity-oriented typologies, environmental behaviour typologies, typologies about individuals' relationship to animals, eco-tourism typologies, policy typologies, and green marketing typologies. The aim of the typological review was to identify existing typologies and explore constructs used. The typologies were then reviewed based on their use of singular or mixed methodologies, whether they used typologies to build theory, and whether they designed typologies as systems. The review identifies gaps in existing typological research as well as providing a framework for comparison with the typologies developed in this study.

Table 2 gives a list of the abbreviations used in Table 3 where the typologies are presented. Table 3 draws on the work published by Flint et al. (2013).

Table 2: Evaluation framework used for typologies

Dimensions of human-nature relationships	Abbreviation
Intrinsic dimensions	**ID**
Demographics	*ID/D*
Personality	*ID/P*
Values	*ID/V*
Cognitive dimensions	**CD**
Worldviews	*CD/W*
Environmental awareness, concern and attitudes	*CD/A*
Affective dimensions	**AD**
Connectedness to nature / emotional positionality	*AD/CN*
Behavioural dimensions	**BD**
Environmental behaviour	*BD/B*
Methodological approach	**MA**
Mixed – singular method	*MA/M*
Using typologies to build theory	*MA/T*
Designing typologies as systems	*MA/S*

Table 3: Sample evaluation of existing typologies

Field	Publication	Typology Names	Context and analysis	Constructs	Shortcomings
Global Warming (GW) ***Emergence***	Leiserowitz et al. (2009)	• Alarmed • Concerned • Cautious • Disengaged • Doubtful • Dismissive	• USA, nationally representative, online panel • N = 2164 • Two quantitative questionnaires; two weeks apart	• Beliefs global warming • Global warming risk perceptions • Expected outcomes of taking action to reduce global warming • Policy importance of global warming • Activism views, intention, barriers • Behaviour • Civic engagement • Values • Attitudes • Environmental beliefs and concerns • Religion • Information seeking, media use	• *ID/P* • *AD/CN* • *MA/M* • *MA/T* • *MA/S*
Climate Change (CC) ***Emergence***	Barnes and Toma (2012)	• Regulation skeptic • Commercial ecologist • Innovator • Disengaged • Negativist • Positivist	• Scotland dairy farmers • Telephone survey • N = 671	• Attitudes, values, behaviours towards climate change related issues	• *ID/P* • *CD/W* • *AD/CN* • *MA/M* • *MA/T* • *MA/S*
Climate change & Sustainability (CC/SS) ***Emergence***	Hall et al. (2018)	• Sceptical • Cautiously Worried • Highly Concerned	• USA • N = 600 • Longitudinal, 1 year, 7 measurement times	• Frequency of pro-environmental behaviours • Belief in climate change, causes, perceived harm, personal relevance and efficacy, political efficacy and policy endorsement • Perception of weather events over time	• *ID/P* • *ID/V* • *CD/W* • *AD/CN* • *MA/M* • *MA/T* • *MA/S*

				• Trust in media and science • Environmental identity congruence	
Climate Change & Sustainability (CC/SS) ***Emergence***	Poortinga and Darnton (2016)	• Enthusiasts • Pragmatists • Aspirers • Community focused • Commentators • Self-reliant	• Wales • Face-to-face interviews • N = 1538	• Views on sustainability and sustainable living • Values • Attitudes to climate change • Attitudes to energy security • Attitudes to community and place • Behaviour	• *ID/P* • *CD/W* • *AD/CN* • *MA/M* • *MA/T* • *MA/S*
Positionality (POS) ***Emergence***	Bauer, Wallner and Hunziker (2009)	• Nature-connected users • Nature-sympathisers • Nature controllers • Nature lovers	• Switzerland, mail survey • Questionnaire design from Qualitative interviews • N = 1536 • Cluster Analysis	• Attitudes towards nature (naturalistic, ecological, humanistic, moralistic, domineering, utilitarian, aesthetic) • Attitudes towards wilderness and rewilding • Values	• *ID/P* • *CD/W* • *BD/B* • *MA/T* • *MA/S*
Positionality (POS) ***Emergence***	Berghöfer, Rozzi and Jax (2008)	• Embedded relationship with nature • Cultivating relationship • Changing relationship • Resource-use relationship • Intellectual relationship • No direct relationship • Aesthetic relationship	• Chile, Cape Horn biosphere • Qualitative focus groups • N = 5; different sociocultural groups • Participant observation interviews; N = 67 • Used Grounded Theory to identify constructs	• Knowledge • Interactions with nature (material versus non-material) • Relationship with nature	• *ID/P* • *ID/V* • *CD/W* • *MA/M* • *MA/T* • *MA/S*
Positionality (POS)	Bernstein and Szuster (2018)	• Pragmatic reformers • Activist greens • Ecomodernists	• USA • Exploratory focus groups	• Degree of pro-environmental-ness • Attitudes towards technology, nature, society	• *ID/P* • *ID/V*

Emergence		• Ecofatalists	• 22 in-depth interviews using questionnaires		• *MA/M* • *MA/T* • *MA/S*
Positionality (POS) ***Emergence***	De Groot and Van den Born (2003)	• Man the adventurer and exploiter of nature • Man responsible for nature • Man the participant in nature	• Netherlands • Factor Analysis • N = 172	• Images of nature (arcadian nature, penetrative nature, elementary nature) • Human-nature relationship (anthropocentrism-non-anthropocentrism)	• *ID/P* • *ID/V* • *CD/W* • *CD/A* • *BD/B* • *MA/M* • *MA/T* • *MA/S*
Positionality (POS) ***Existing***	Hunka et al. (2009)	• Conqueror of nature • Steward of nature • Participant in nature	• Poland • Survey, N = 179; Factor Analysis • Interviews, N = 26	• Visions of nature • Relationship with nature (anthropocentrism – ecocentrism) • Values • Worldviews	• *ID/P* • *CD/A* • *BD/B* • *MA/T* • *MA/S*
Positionality (POS) ***Emergence***	Pike et al. (2008)	• Greenest Americans • Idealists • Caretakers • Traditionalists • Driven independents • Murky middles • Fatalists • Materialists • Cruel worlders • UnGreens	• USA, home surveys • N = 2000 • Mixed methods: Qualitative to validate Quantitative	• Policy • Behavioural • Personality • Values • Worldviews • Environmental positionality • Concerns and Attitudes	• *AD/CN* • *MA/T* • *MA/S*
Positionality	Van den Born (2008)	• Master over nature	• Netherlands	• Images of nature, worldviews	• *ID/P*

(POS) ***Existing***		• Steward of nature • Partner with nature • Participant in nature	• Interviews to elaborate on typologies • N = 31	• Values of nature • Images of relationship	• *CD/A* • *BD/B* • *MA/M* • *MA/T* • *MA/S*
Positionality (POS) ***Existing***	Zheng and Yoshino (2003)	• Man must follow nature • Man must make use of nature • Man must conquer nature	• Japan, N = 2265 • USA, N = 1563 • Britain, N = 1043 • France, N = 1013 • Germany, N = 1000 • Italy, N = 1048 • Netherlands, N = 1083 • Comparative study using survey	• Nature and environmental worldviews • Importance of environmental preservation	• *ID/P* • *ID/V* • *CD/A* • *AD/CN* • *BD/B* • *MA/M* • *MA/T* • *MA/S*

Biodiversity (BIO)
 	
Emergence
	Buijs, Fischer, Rink and Young (2008)	• Humans as part of nature
		  ○ Humans as participants in nature
		  ○ Humans as responsible managers
		• Humans as separate from nature
		  ○ Humans as stewards
		  ○ Humans as enemies
		• Humans as users and engineers
			• Netherlands, Scotland, Germany; protected areas and not general public
			• 19 qualitative focus groups
			• N = 95
				• Relationship with protected areas
				• Attitudes and relationship with biodiversity and nature
				• Worldviews
					• *ID/P*
					• *ID/V*
					• *BD/B*
					• *MA/M*
					• *MA/T*
					• *MA/S*

Biodiversity (BIO) ***Emergence***	Fischer and Young (2007)	• Humans as potential enemies of nature • Humans as users of nature • Humans as active managers of nature	• Scotland, Cairngorms National Park • Qualitative focus groups • N = 8; 43	• Role of humans in biodiversity management • Experience and perceptions of biodiversity • Values • Relationship between humans and biodiversity	• *BD/B* • *ID/P* • *CD/A* • *MA/M* • *MA/T* • *MA/S*
Behaviour (BEH) ***Emergence***	Defra (2008)	• Positive greens • Waste watchers • Concerned consumers • Sideline supporters • Cautious participants • Stalled starters • Honestly disengaged	• UK general population • N = 3 600 • Desk research • Qualitative • Quantitative	• Behaviour (i.e. personal transport, homes energy, water, waste and eco-products) • Attitudes • Beliefs	• *ID/P* • *ID/V* • *CD/W* • *AD/CN* • *MA/T* • *MA/S*
Behaviour (BEH) ***Emergence***	Elgaaied (2012)	• Apathetic • Converted • Undecided •	• France • Qualitative to identify variables, N = 1 focus group • Cluster analysis, N = 276	• Recycling behaviour • Environmental concern • Awareness of negative consequences • Anticipated guilt	• *ID/P* • *ID/V* • *CD/W* • *AD/CN* • *MA/T* • *MA/S*
Behaviour (BEH) ***Emerging***	MacDonald et al. (2019)	• Environmentally active • Well informed • Active outdoors • Socially motivated	• New Zealand • Online survey • N = 2 124	• New ecological paradigm worldviews • Environmental locus of control • Environmental concern • Connectedness to nature • Place attachment • National identity • Outdoor activities/behaviours • Wellbeing	• *ID/P* • *ID/V* • *MA/M* • *MA/T* • *MA/S*

				• Environmental and conservation behaviours • Perceived barriers and benefits	
Behaviour (BEH) ***Emerging***	Poškus and Žukauskienė (2017)	• Positive • Extraverted and open • Agreeable and closed • Negative	• Lithuania, high school students • N = 612 • Questionnaire	• Big five personality traits • Recycling attitudes, norms, control, intentions, past behaviour	• *ID/V* • *CD/W* • *CD/A* • *AD/CN* • *MA/M* • *MA/T* • *MA/S*
Behaviour (BEH) ***Existing***	Thompson and Barton (1994)	• Ecocentric • Anthropocentric	• USA • Two quantitative studies • N = 115 & N = 72	• Attitudes and concern • Worldviews • Behaviour	• *ID/P* • *ID/V* • *AD/CN* • *MA/M* • *MA/T* • *MA/S*
Animals (ANI) ***Existing***	Kellert (1980)	• Utilitarian • Naturalistic • Ecologistic • Aesthetic • Humanistic • Moralistic • Scientistic • Dominionistic • Negativistic • Neutralistic	• USA survey • N = 3 107 • Mall surveys with sheep producers, trappers, vegetarian times subscribers	• Attitudes towards animals (not plants)	• *ID/P* • *ID/V* • *CD/W* • *AD/CN* • *BD/B* • *MA/M* • *MA/T* • *MA/S*
Animals (ANI)	Teel and Manfredo (2010)	• Traditionalist (mastery)	• USA	• Value orientations towards wildlife	• *ID/P*

Emerging		• Pluralist (domination & mutualism) • Mutualist (egalitarian) • Distanced	• Mail survey • N = 12 673 • Confirmatory factor analysis	• Domination versus Mutualism worldviews	• *CD/A* • *AD/CN* • *BD/B* • *MA/M* • *MA/T* • *MA/S*
Eco-tourism (ET) ***Emergence***	Cini, Leone and Passafaro (2012)	• Post-modern tourists • Wellness tourists • Unconventional tourists • Vacationer tourists • Ecotourists	• Italy • N = 365 • Cluster analysis	• Holiday motivations • Personality • Values • Environmental beliefs, worldviews • Behaviour	• *AD/CN* • *MA/M* • *MA/T* • *MA/S*
Eco-tourism (ET) ***Emergence***	Gupta and Chopra (2014)	• Eco-visionaries • Environment conservators • Wastage avoiders	• India • N = 210 • Cluster analysis	• Behaviour	• *ID/P* • *ID/V* • *CD/W* • *CD/A* • *AD/CN* • *MA/M* • *MA/T* • *MA/S*
Policy (POL) ***Emergence***	Osherenko (1992)	• Conquest and colonization • Balanced development • Sustainable and regenerative development • Rational ecology • Ecofeminism • Indigenous perspectives	• Arctic • Policy review for expressions	• Policy • Developmental aims • Expression of human-nature nexus	• *ID/P* • *ID/V* • *CD/W* • *BD/B* • *MA/M* • *MA/T* • *MA/S*

Green marketing (GRM) ***Emergence***	Awad (2011)	• Green • Ambiguous • Undevoted • Explorers	• Bahrain • Questionnaire • N = 241 • Factor analysis, regression, k-means	• Environmental concern • Environmental positionality • Ecological Conscious Consumer Behaviour (ECCB)	• *ID/P* • *ID/V* • *CD/W* • *MA/M* • *MA/T* • *MA/S*
Green marketing (GRM) ***Emergence***	Balderjahn Peyer, Seegebarth, Wiedmann and Weber (2018)	• Financially careless consumers • Non-simplifiers • Socially conscious financial simplifiers • Sustainable, non-collaborative consumers • Sustainable consumers	• Germany • Online survey • N = 1833 • FMCG panel, N = 3335 Textile panel, N = 8475	• Values • Beliefs • Buying behaviour	• *ID/P* • *AD/CN* • *MA/M* • *MA/T* • *MA/S*

Emergence: *Typologies that emerged from the data (unique)*

Existing*: Typologies that emerged from a previous study (confirmatory/duplicated)*

Overall the typological studies listed in the above table fail to add new knowledge (building theory) to the field of climate psychology and ecopsychology since they treat constructs as mostly mutually exclusive (i.e. linearity) concepts without consideration for causal or correlational relationships (i.e. using multiple variables) that explain the typology as a living system (i.e. systems thinking). Instead, the typologies are described as fragmented representations of individuals that fail to acknowledge the deeper underlying reasons for why they have certain beliefs and attitudes towards global warming, climate change, sustainability, positionality, biodiversity, behaviour, animals, eco-tourism, policy, and green marketing. Furthermore, few typologies explore the affective relationship individuals have with the biosphere, therefore excluding an aspect of the typological functioning imperative towards understanding psychological processes that underpin constructs such as beliefs, attitudes and behaviour. The section below further explores the reviewed typologies.

2.5.4.1 Global warming, climate change, and sustainability typologies

There are few non-linear, multifaceted studies that build typologies around global warming, climate change and sustainability (GW/CC/SS). Two leading studies in this regard are the typologies built by Leiserowitz et al. (2009), duplicated by Metag et al. (2017), and the study done by Poortinga and Darnton (2016) that will be discussed first. Two other noteworthy studies to be discussed are those done by Barnes and Toma (2012) and Hall et al. (2018). These studies will be critically evaluated in more depth.

The relationship to global warming typologies developed by Leiserowitz et al. (2009) was conducted in the USA (N = 2464) and extended to Germany, Australia, and India. They identified six typologies namely the *Alarmed*, *Concerned*, *Cautious*, *Disengaged*, *Doubtful*, and *Dismissive* that described individual beliefs about global warming based on issue prioritisation, policy preferences, reasons for and against action, activism inclination, beliefs, risk perceptions, degree of information seeking, approach to emission reduction, and messaging trust. The *Alarmed* believed that global warming was happening now and that it was anthropocentric. They fostered egalitarian values, were non-materialistic, less religious and showed slightly more investment in energy efficiency improvements in their homes compared to the other types. The *Concerned* typology believed that global warming was happening but was less convinced as they viewed it as less of a personal threat. They prioritised the quality of life of their children and grandchildren. They were moderately egalitarian and identified as environmentalists. The *Cautious* typology had a weak belief and sense of the importance of global warming. They felt less informed about the issue, felt it was a concern for the future, and they had low traditional religious beliefs. The *Disengaged* typology lacked knowledge or opinions about global warming. They did not give the issue much attention and didn't believe that individual behavioural changes would make a difference. They had egalitarian values, traditional religious beliefs and didn't see themselves as environmentalists. The *Doubtful* included those who believed global warming was happening and those who didn't know. Due to their attitudes, they did not see it as a threat but did value saving money through energy conservation. They harboured individualistic values and were traditionally religious. The *Dismissive* typology thought that global warming was not occurring or at least humans did not cause it. They believed there was no danger and therefore global warming should not be a priority. They tended to be in favour of oil drilling, building nuclear power plants and opposed greenhouse reduction policies. They

expressed individualistic values and were the strongest in traditional religious beliefs. Metag et al. (2017) replicated this study in Germany and confirmed the presence of these typologies except for the Dismissive typology. These studies were largely focused on global warming and would have benefited from obtaining a deeper and contextual understanding of the reasons underlying the beliefs and whether they were related to affect or mediating factors such as personality. Without understanding the deeper psychological processes, the typologies cannot be effectively used and targeting will remain superficial.

The relationship to sustainability typologies developed by Poortinga and Darnton (2016) was conducted in Wales (N = 1538) in the UK and aimed to provide input in developing tailored communication and behaviour change initiatives. They identified six typologies namely the *Enthusiasts*, *Pragmatists*, *Aspirers*, *Community-focused*, *Commentators* and *Self-reliant* based on values, views on sustainability and sustainable living, attitudes towards climate change, attitudes towards energy security, and attitudes towards community and place. The *Enthusiasts* were the most concerned about climate change, and they engaged with all issues on sustainability. They scored the highest on self-transcendence values. The *Pragmatists* showed lower levels of climate change and sustainability engagement, but they were worried about it. They saw the environment as a priority over economic growth, and they viewed sustainable living positively. They tended to show moderate engagement with environmental sustainability and energy security. The *Aspirers* scored high on self-enhancement and openness-to-change values; they supported prioritising economic sustainability. They were less concerned about energy security compared to the other typologies. The *Community focused* typology scored high on conservative values and prioritised community engagement. The economy was a priority for them over the environment. They showed high levels of place attachment and valued social capital more than energy security. The *Commentators* typology was the least engaged with environmental sustainability. They were unlikely to foster pro-environmental beliefs and viewed a sustainable lifestyle as low importance. They were the typology that was least concerned about climate change, and they tended to value self-enhancement, openness-to-change, and conservative views. The *Self-reliant* typology was the opposite of the *Enthusiasts* and showed overall disengagement. They had negative attitudes about environmental sustainability, and they were sceptical about climate change. They did not value place or social capital, but they did prioritise the economy and energy security. They scored the lowest on self-transcendence values. The study fails to include an affective component that explores the deeper motivational forces of typologies and how their worldviews and personality relate to their attitudes and affect towards nature. Although the study was later followed up by qualitative work (reported directly to the Welsh government) aimed at a deeper understanding of motivations, values, and lifestyles, there remains a lack of insight around the affective relationships with the biosphere and associated contexts that impact views towards sustainability. The published study would have benefited from combining the results from both the quantitative and qualitative studies in order to build theory. Building theory would have allowed the typologies to emerge as holistic entities rather than fragmentations of attitudes, values and behaviours.

A typology study of dairy farmers' perceptions towards climate change developed by Barnes and Toma (2012) was conducted in Scotland (N = 671) in order to provide insight for targeting policy interventions at industry level. They identified six typologies namely the *Regulation sceptic*, *Commercial ecologist*,

Innovator, *Disengaged*, *Negativis*t and *Positivist* based on attitudes, values and behaviours towards climate change related problems. The *Regulation sceptic* was highly sceptical of any regulation in the industry since they were focussed on profits. They did not believe that climate change would impact their future production decisions. The *Commercial ecologist* believed that there were ecological concerns relating to climate change but they did not see it as a significant enough threat to motivate them to change their farming approach. The *Innovator* typology consisted of flexible farmers who showed keen adoption of new climate change related technologies that had financial benefits. The *Disengaged* typology had no opinion about climate change and were typically non-adopters of new technology. The *Negativist* thought that climate change would impact them in the future and therefore they aimed to maximise profits and showed an interest in openness to adaptive best practices. The *Positivist* typology was concerned about climate change and passively managed climate change impacts. However, the study fails to explore individual traits of farmers such as their worldviews and personality that might impact reasons for their approach to climate change. This is problematic, as individual traits would provide further insight that might more accurately determine reasons for disengaged by certain types and provide further suggestions on farming strategies and responses to risk. Disengagement might manifest from aspects unrelated to their farming practices, yet these remain unexplored. Furthermore, understanding deeper psychological processes would have been useful, for example in the case of the *Commercial ecologist* who did not see climate change as a significant enough threat to alter their business approach. If the study managed to understand deeper psychological motivation there could have been insight into indirect motivators (for example the importance of future generations of family farming) that might increase their concern about climate change impacts.

Hall et al. (2018) conducted a one-year longitudinal study with 600 American adults. They identified three typologies using climate change beliefs, pro-environmental behaviour, and other climate-related measures. The three typologies identified where the *Sceptical*, *Cautiously worried,* and *Highly concerned*. The *Highly concerned* showed the strongest beliefs in climate change, supporting climate change policies but had the lowest individual pro-environmental behaviour. The *Cautiously worried* expressed concerns about climate change but these varied according to season. The *Sceptical* showed increasing doubts about climate change over the study period, opposed climate change policies but was the most likely to behave pro-environmentally. The typologies formed are superficial in that they are unable to explain why *Sceptics* behave pro-environmentally and are also unable to provide an understanding of the underlying motivations for climate change beliefs. Furthermore, the study does not clarify differences in policy versus behavioural motivation between typologies. Important factors that could contribute to climate change beliefs, but were excluded from this study are an understanding of personality, worldviews, values and affective connectedness to nature. These are important aspects to consider since beliefs are often tied to a situation and subject to shift under different conditions (Kennedy et al., 2009).

Although these sets of typologies are valuable in understanding beliefs and attitudes towards global warming, climate change, and sustainability their focus was mainly on explaining current attitudes, beliefs, and behaviour rather than forming a deeper understanding of how these are shaped and how they are mediated or not mediated by their affective relationship with the biosphere and their life history.

Furthermore, these typologies are treated as linear and simplistic ways of understanding individuals rather than looking at individuals and typologies as complex systems with the various constructs influencing each other. Without understanding psychological processes formed during lifetimes and that influence perceptions of climate change and global warming, developing strategic micro-campaigns and policies might be difficult and ineffective. Another aspect that is questionable is the relationship between the individual and the study variable. The typologies come across as placing typologies outside of these environmental issues rather than in relation to them, that is to say their relationship to the biosphere and what that means for perceptions about climate change, global warming, and sustainability is lacking. Personality was not included in any of these typologies and none of the typology exercises built theory or used systems thinking.

2.5.4.2 Positionality typologies

Positionality typologies (POS) explore views on how humans relate to the biosphere through focussing on more than just attitudes, and instead they explore the relationship between individuals and some form of the biosphere (preservation, landscape preferences, visions of nature, knowledge, interactions). Some of these positionality typologies include the multi-country studies conducted by Bauer et al. (2009), Berghöfer et al. (2008), Bernstein and Szuster (2018), De Groot and Van den Born (2003), Hunka et al. (2009), Pike et al. (2008), Van den Born (2008), and Zheng and Yoshino (2003).

A positionality study conducted by Bauer et al. (2009) identified four typologies namely *Nature-connected users*, *Nature-sympathisers*, *Nature controllers*, and *Nature lover* types based on a mixed-methods study which covered attitudes towards nature, attitudes towards wilderness, and values. *Nature-connected users* had a utilitarian attitude towards nature, and they felt affectively connected to nature. *Nature-sympathisers* valued nature as something to utilise and had a more distanced relationship with nature. *Nature controllers* had conservative attitudes towards nature and saw nature as something to be influenced. *Nature lovers* believed that nature and humans were interconnected and that human influence over nature needed to be reduced. The typologies identified failed to describe deeper and more meaningful differences between individuals since there are overarching aspects of for example the *Nature-connected users* and the *Nature lovers* typologies. Depth could have been obtained by including personality and worldviews while exploring the detailed construction of the typological relationship with nature and the psychological processes that underpin these relationships. Without these deeper insights it is challenging to explain the reasons why people have these relationships with nature and also to understand the nuanced differences between these typologies. The typologies seem poorly differentiated.

Berghöfer et al. (2008) conducted a study in the Cape Horn biosphere in Chile using focus groups and participant interviews. From this research seven different relationships with nature emerged. Individuals could have an *Embedded relationship*, *Cultivating relationship*, *Changing relationship*, *Resource-use relationship*, *Intellectual relationship*, *No direct relationship*, and an *Aesthetic relationship*. The typologies emerged through exploring knowledge, interactions with nature (material versus non-material) and their relationship with nature. The *Embedded relationship* included associating symbolic

meanings to places of ancestors and the belief that there is no separation between plants and animals. The *Cultivating relationship* was based on a strong sense and dependence on place. The *Changing relationship* was a relationship that was previously disconnected but changed to being more experiential and appreciative. The *Resource-use relationship* was based on the use of nature for immediate benefits without concern for the long-term costs. This relationship was characterised by economic dependence on nature and exploitative behaviour. The *Intellectual relationship* was one based on knowledge and the educational value of nature. This relationship was based on the idealisation of nature and a high appreciation for nature. The *No direct relationship* was characterised by disconnectedness and isolation from the natural environment. The *Aesthetic relationship* with nature was based on the pleasure received from living in nature rather than in an urban environment. One pertinent issue with these typologies is that there exists an ideological overlap between them because there is a lack of nuanced differentiation. For example, having no direct relationship with nature could mean seeing nature only as a resource. Furthermore, having an intellectual relationship with nature means that it could also be appreciated for its aesthetics. Methodologically, the study used grounded theory to identify constructs when it would have been more powerful if it were used to build theory.

Bernstein and Szuster (2018) conducted a study by doing 22 in-depth interviews and looking at environmental worldviews through surveys and repertory grid analysis. They identified four typologies namely *Pragmatic reformers*, *Activist greens*, *Ecomodernists,* and *Ecofatalists*. The *Pragmatic reformers* believed that the earth has limited space and resources and that it cannot support many more people. They also believed that the planet was heading for disaster but that technology might be able to help in conjunction with laws and policies. The *Activist greens* believed that modern lifestyles harm nature and that humans impact harmony with nature. They also believed there are limits to how much the earth can take before disaster strikes. They had little belief in technology and policy. *Ecomodernists* denied that the earth was reaching its limits and they did not believe that catastrophe was looming. They believed that technology was the answer to environmental issues. *Ecofatalists* were undecided whether humans should leave nature alone or not and were not convinced that over-population was a concern. They supported individuals making changes for the sake of the environment. This study used a unique methodology that asked participants to create their own categories that allowed for individuals to shape what was important to them when it comes to the biosphere. The study might have benefited from exploring intrinsic influencers such as personality and values and then relating these to the other findings to build theory. Furthermore, the study would benefit from validating the emerging typologies with a larger sample.

The relationship between humans and nature developed by De Groot and Van den Born (2003) was conducted in the Netherlands (N = 172). They identified three typologies namely *Man the adventurer and exploiter of nature*, *Man responsible for nature,* and *Man the participant in nature*. These typologies were developed by looking at images of nature (arcadian nature, penetrative nature, and elementary nature) and the perceived human-nature relationship that was either anthropocentric or non-anthropocentric. *Man the adventurer and exploiter of nature* included the belief that environmental problems are solved through technology and science, that economic growth is required to solve environmental problems, that nature is for humans to utilise, and that humans are above nature. This

typology favoured human-made and park-like landscapes. *Man responsible for nature* included the belief that humans form a part of nature and that the conservation of nature was the responsibility of man, man and nature are equal, and they each deserve their habitat. *Man the participant in nature* was the desire to be interconnected with nature physically and spiritually. Both *Man responsible for nature* and *Man the participant in nature* typologies preferred landscapes in which they might experience the intensity of nature (the coast, the great lakes and big skies). Although these typologies were emergent, they used limited variables. They included images of nature and used a dualistic model based on anthropocentrism - non-anthropocentrism to identify the human-nature nexus. This study failed to include important contributors to understanding the human-nature nexus such as personality, values, worldviews, attitudes, behaviour, and context. These typologies are similar to those explored by Van den Born (2008) and Van den Born and De Groot (2009) that included M*aster over nature*, *Steward of nature*, *Partner with nature*, and *Participant in nature*. *Master over nature* included the idea that humans are superior and that economic growth and technology take priority. *Steward of nature* was the conception that humans own nature and humans' responsibility is towards God and future generations. *Partner with nature* was the idea of equality and that actions need to benefit both nature and humans. *Participant in nature* had a spiritually strong bond with nature and a strong sense of ecological self. These two studies tested existing typologies rather than allowing the emergence of original types. These studied typologies were also used in a comparative study in France (N = 483), Germany (N = 614), and the Netherlands (N = 714) by De Groot, Drenthen and De Groot (2011) and earlier by De Groot and De Groot (2009) and Van den Born (2006).

The vision of nature methodology used by Hunka et al. (2009) explored existing typologies through a survey that included visions, relationship with nature, values, and worldviews. Their results confirmed three typologies namely *Conqueror of nature*, *Steward of nature*, and *Spiritual participants* in nature. These typologies also occur in a study conducted by De Groot et al. (2011). The *Conqueror of nature* type believed that humans have rights over nature and should augment nature in any way that benefits humans. The *Steward of nature* type believed in protecting the environment as the creation of God and humanity's home. The S*piritual participant in nature* type believed in interconnectedness between humans and nature, and they showed strong biophilia tendencies. These typologies identified show overlap with those identified by Van den Born (2008) and added no new insights into individuals relationship with the biosphere and how these relationships are formed in the context of universal values, personality, attitudes, concerns, or behaviour. The study would have benefitted from extending explorations beyond the limitations of dualistic values identified as anthropocentrism-ecocentrism and linking those with individual constructs to explain nuances.

Pike et al. (2008) identified a range of typologies based on environmental worldviews, policy, behaviour, personality, values, environmental positionality, and a range of concerns (environmental, financial stability etc.) and attitudes. The typologies identified included *Greenest Americans* (perceived interconnectedness between own life and environmental impacts), *Idealists* (evolving own lifestyle to live more environmentally friendly), *Caretakers* (family-focussed when it comes to environmental health), *Traditionalists* (religion influences relationship with nature, humanity superior), *Driven Independents* (Success prioritised over protecting the earth), *Murky Middles* (Indifferent towards the

environment), *Fatalists* (Materialistic and unfocussed on the environment), *Materialists* (Environment cannot be protected), *Cruel Worlders* (Isolated and resentful therefore no place for environmental concerns) and *UnGreens* (Prosperity of a nation involves environmental destruction). The *Greenest Americans*, *Idealists* and *Caretakers* were those that had stronger environmental worldviews although many did not identify as environmentalists. *Traditionalists*, *Driven Independents* and *Murky Middles* did not concern themselves much with ecological issues, but they were not against protecting the environment. The *Fatalists*, *Materialists*, *Cruel Worlders,* and *UnGreens* were more focussed on current individualistic matters rather than those threatening the environment. The study provides insight into a range of identified typologies but lacks an exploration of the typological affective connectedness to nature and a deeper description of the elements that make the typologies different from each other. Individual beliefs such as care-taking and materialism could be aspects found in a range of other typologies, although differently expressed. Therefore, the study would have benefitted from using the qualitative phase for deeper and more nuanced exploration as to the reasons typologies have this relationship with the biosphere and how their life experiences shape their views. A deeper understanding would have contributed to building theory, new knowledge and insight into non-superficial targeting strategies through including context and nuance.

The relationship to nature and the environment typologies developed by Zheng and Yoshino (2003) was conducted in Japan (N = 2265), USA (N = 1563), UK (N = 1043), France (N = 1013), Germany (N = 1000), Italy (N = 1048), and the Netherlands (N = 1083). They used worldviews and the importance of environmental preservation to build their typologies. They identified three typologies namely *Man must follow nature*, *Man must make use of nature,* and *Man must conquer nature*. The typology *Man must follow nature* was found to be more prominent in the USA and Italy and included positive environmental opinions about energy conservation and environmental preservation. The typology *Man must make use of nature* showed an inclination towards neutrality on environmental issues and was represented in the UK, Netherlands, and Germany. The *Man must conquer nature* included dominionistic attitudes towards the environment and was represented in Japan and France. Although the study provides a comparison between countries, they were all developed countries. A more useful comparison would have been to include some developing countries. Furthermore, the study identified superficial typologies that fail to look at deeper and more meaningful differences between individuals that could exist if aspects were explored like values, personality, and affect towards nature. The study would have benefited from an understanding of how individuals in each typology and country relate to the biosphere, what the source of this relatedness was, and what that means in relation to their values and attitudes. Furthermore, the study would have added value by exploring perceptions and relatedness towards animals as part of nature. The typologies are problematic in that they represent humanity as separate from nature and that has implications for the potential efficacy of future campaigns as it reinforces duality.

From these sets of positionality typologies only one study included personality and only four included values as intrinsic dimensions. Worldviews and the exploration of environmental awareness, attitudes, and concerns were partially represented, with five studies explicitly exploring the individual's relationship with nature, but lacking depth of the contextual and affective element of this relationship. Few studies

included behaviour and only three studies used a mixed methodology. None of the studies used typologies to build theory or systems.

2.5.4.3 Biodiversity typologies

Biodiversity typologies are those that explore specific perceptions or relationships towards biodiversity of plant and animal life in a specific area. Two biodiversity emerging typologies (BIO) reviewed were those built by Buijs et al. (2008) as well as Fischer and Young (2007).

Buijs et al. (2008) conducted a study to identify people's relationship with biodiversity in protected areas in the Netherlands (Drents Friese Wold National Park), Scotland (Cairngorms National Park), and Germany (South-East Rügen Biosphere Reserve). They explored worldviews, attitudes, and the relationship with biodiversity and nature as well as individual relationships with protected areas. They identified two leading roles of humankind in nature, namely humans as connected to nature and humans as separate to nature. Within these two dimensions, five different typologies emerged, namely *Humans as participants in nature*, *Humans as responsible managers*, *Humans as stewards*, *Humans as enemies* and *Humans as users and engineers* (Flint, Kunze, Muhar, Yoshida, & Penker, 2013). This study also took an observer perspective similar to the typologies identified by Fischer and Young (2007). A potential shortcoming with observer-based typologies (dualistic typologies that explore perceptions of nature as separate from nature, rather than individual relationships with nature) is that they fail to include the deeper individual psychological processes that explain the human-nature nexus. Without including individual understandings of personality, values, and behaviour the typologies become an expression of their views about humanity rather than views about themselves that could have implications for campaign strategies. The risk is that individuals could change perceptions when biodiversity management strategies have an impact on them personally. These typologies fail to provide an understanding of individual relationships with biodiversity and how individual constructs, including those related to personal experiences, and individual fears relate to behaviour, personality, and values. These studies are unable to explain how individuals experience themselves as part of the biodiversity system and what that means for biodiversity theory. Generic typologies that express simplistic relationships are unable to provide strategic input for micro-campaigning that aims to resonate with the psychological processes of individuals.

Fischer and Young (2007) conducted a biodiversity-focused study focussing on the Cairngorms National Park in central Scotland exploring the role of humans in biodiversity management, experience and perceptions of biodiversity, values, and the relationship between humans and biodiversity. They identified three types of people based on their relationship to biodiversity, namely *Humans as potential enemies of nature*, *Humans as users of nature*, and *Humans as active managers of nature*. These typologies are similar to some of the previous positionality typologies described earlier. The *Humans as potential enemies of nature* are those people who believed that humans are foes of nature. The *Humans as users of nature* type attached value to biodiversity based on its recreational value. The *Humans as active managers of nature* believed that the restoration of biodiversity was essential. These researchers argued that an understanding of the human-biodiversity nexus would increase the ability of

organisations to engage the public more effectively in biodiversity decision-making processes. However, the study expresses a focus on the human-nature nexus without providing a deeper exploration of how the individuals interviewed see themselves in relation to biodiversity and what role their own behaviour might play in its preservation or destruction. The observer/disconnected approach taken has implications for when policy or management strategies personally impact individuals, as perceptions then change based on individual personality, attitudes, and behaviours. The incongruence between drawn perceptions of biodiversity and those verbally expressed indicates a chasm that might have been explained through deeper individual explorations of the affective relationships with nature.

2.5.4.4 Behaviour typologies

Behavioural typologies (BEH) are popular, but understanding what shapes environmental behaviour is complex as environmental knowledge and awareness do not necessarily lead to pro-environmental behaviour (Kollmuss & Agyeman, 2002). Behaviourally-based typologies to be considered are those developed by Defra (2008), Elgaaied (2012), MacDonald et al. (2019), Poškus and Žukauskienė (2017) and Thompson and Barton (1994).

Defra (2008) conducted a non-linear study (using mixed methods) focusing on behaviour, beliefs, and attitudes. This identified seven typologies, namely the *Positive greens*, *Waste Watchers*, *Concerned consumer*, *Sideline supporters*, *Cautious participants*, *Stalled starters*, and *Honestly disengaged*. The *Positive greens* showed concern about their impact on the environment and were less materialistically motivated. They held strong environmental attitudes and beliefs and were more likely to behave pro-environmentally. The *Waste watchers* showed their behavioural ability, but lacked the willingness to reduce their environmental impact over and above reducing waste. They were sceptical about the urgency of environmental issues and were less likely to feel guilty about the impact they have on the environment. The *Concerned consumer* was worried about climate change and felt that they did more than the average person for the environment. However, they denied that the earth was reaching its limits to growth and they did not believe that an ecological crisis was looming. The *Sideline supporters* showed the inability to behave environmentally although they were concerned about climate change. The *Cautious participants* felt there was a crisis and limits to growth but showed pessimism about their ability to address climate change. They expressed barriers to pro-environmental behaviours, yet they felt guilty about harming the environment. The *Stalled starters* expressed confused environmental views. They viewed climate change as too far in the future, and felt that the environment was not a high priority for them. The *Honestly disengaged* were disconnected from climate change and claimed that they would live the way they liked regardless of an ecological disaster. Attitudes and beliefs alone are insufficient for determining the reasons people behave the way they do since individuals are complex and influenced by a complex interplay of intrinsic, cognitive, and affective factors when it comes to beliefs and behaviour. By including constructs related to personality, values, worldviews, and affective connectedness to nature, non-environmental focus areas can be used to design pro-environmental campaigns that resonate with individuals. The lack of understanding why individuals have specific attitudes and beliefs is problematic as it would provide better insight into the reasons why campaigns that focus on changing behaviour have a limited impact.

Elgaaied (2012) conducted a study to determine typologies that described the relationship between anticipated guilt and adoption of recycling behaviours. Three typologies were identified, namely the *Apathetic*, *Converted,* and *Undecided* based on recycling behaviour, anticipated guilt, environmental concern, awareness of the negative consequences related to non-recycling, and perceived facilitating conditions. The *Apathetic* type cared very little about the environment, and were non-recyclers. The *Converted* were people who recycled diligently, and the *Undecided* were potential recyclers. Determining individual behaviour in the context of concern, awareness, and guilt alone fails to explain why some people might be concerned but still do not behave pro-environmentally. Important differences between individuals determined by values, worldviews, and their relationship with the biosphere have the ability to provide insight into underlying psychological processes, providing broader typological context over and above concern, awareness and guilt. Furthermore, the study is problematic in that it does not explain why people in these typologies behave in this manner over and above reasons related to concern, awareness, and guilt.

A study done by MacDonald et al. (2019) looking at worldviews, connectedness to nature, locus of control, environmental concern, place attachment, national identity, outdoor activities/behaviours, wellbeing, and environmental/conservation behaviours identified four typologies. The *Environmentally active* type behaved pro-environmentally and showed altruistic concern. They had moderate environmental worldviews and connectedness to nature, yet they claimed the least outdoor engagement. They had higher physical health but lower wellbeing and place attachment as well as lower satisfaction with life. The *Well informed* type showed high egoistic concern, high connectedness to nature, high environmental worldviews, and spent time outdoors. They claimed lower than average pro-environmental behaviours and had high wellbeing, satisfaction with life, and an environmental locus of control but had a slightly lower physical wellbeing. The *Active outdoors* type had the highest outdoor engagement, high biospheric concern, average connectedness to nature, and lower than average environmental worldviews and behaviours. They had high wellbeing but lower environmental locus of control. The *Socially motivated* type had the highest pro-environmental behaviours but were low in connectedness to nature, low outdoor activities, low environmental worldviews, and low environmental concern. The typologies identified by this study are valuable, but limited. A qualitative understanding of how the relationship between these types and nature formed in the context of their personality and values, would have added explanatory power. It would have also added insight into the reasons these typologies function the way they do. Additionally, deeper exploration could have clarified inconsistent findings such as how the *Well informed* has an egoistic concern, yet high environmental worldviews, but less than average pro-environmental behaviours.

Poškus and Žukauskienė (2017) studied adolescents' recycling behaviour using personality types to determine behavioural differences. They identified four typologies namely: *Positive*, *Extraverted and open*, *Agreeable and closed,* and the *Negative* based on the Big Five Personality Inventory and recycling attitudes, norms, perceived control, and past behaviour. The *Positive* type were people who expressed adaptive traits, were extraverted, agreeable, conscientious, open, emotionally stable, and sustainability oriented. The *Extraverted and open* were individuals who might be open and extraverted, yet they were less agreeable and only somewhat conscientious and neurotic. The *Agreeable and closed* were

individuals who expressed agreeableness, were not open and therefore tended to show an external locus of control. The *Negative* type were highly neurotic and less extraverted, agreeable, conscientious, open, and emotionally stable. The *Positive* typology claimed higher recycling behaviour, attitudes and beliefs than the rest and the *Negative* expressed feeling less in control over their recycling ability. Valuable insights are gained from including personality dimensions that describe underlying individual attributes that impact recycling behaviour. It explains for example that those who are a *Negative* type are neurotic and less agreeable and that provides nuances important to consider for intervention strategies that target them. The results also show that attitudes towards recycling do not adequately predict intention to recycle, but without exploring individual differences like values, worldviews, and affect it is challenging to describe additional nuanced differences that might impact recycling behaviour, but are not related to behaviour and personality. The study might have benefited from exploring whether there were types of apathetic, types of converted individuals, or types of undecided individuals in order to provide more nuanced understandings of individual differences based on psychological processes that impact behaviour.

Thompson and Barton (1994) looked at attitudes, concern, and worldviews and their relationship with behaviour. They confirmed two typologies, the *Ecocentric* typology that included individuals who were less apathetic about environmental issues and more likely to engage in conservation behaviour. The *Anthropocentric* type showed environmental apathy and lacked conserving practices. The two typologies identified by this study provide a way of distinguishing between two types of behaviour that are motivated by two simplistic underlying drivers. However, using egocentrism versus anthropocentrism as drivers for understanding the human-nature nexus is limited, as it does not consider the range of other types of relationships that might exist and influence behaviour. Therefore, the study is not sufficient in exploring the complexity underlying ecocentric versus anthropocentric individual motivations and how that relates to individual personality, values, and affective connectedness to the biosphere. The findings from this study are inadequate for micro-campaigning strategies.

In general, the behavioural typologies discussed fail to determine influences and interactions between aspects such as childhood experiences, values, personality, worldviews, social factors, and affective connectedness to nature. These influences and interactions could determine why some individuals who show environmental concern might not behave pro-environmentally and why others who do, do so for individualistic reasons, such as to save money or to improve their health (Gifford & Nilsson, 2014). These studies fail to acknowledge that the human-nature nexus is non-linear and complex (Kollmuss & Agyeman, 2002) and as such they do not use the full power of typology-building that is ideal for exploring multiple relationships between variables in order to discover levels of causal complexity (Doty & Glick, 1994) that is likely to impact behaviour. There is also a need to understand the inner world of individual experiences that impact their relationship with the biosphere and consequently behaviour (Charmaz, 2006; Johnson & Onweugbuzie, 2004) since without these deeper insights, strategies for interventions risk being misdirected.

2.5.4.5 Animal typologies

Few animal related typologies (ANI) exist. The two typologies to be discussed are those developed by Kellert (1980) and Teel and Manfredo (2010).

Kellert (1980) conducted a study with sheep producers, trappers, and Vegetarian Times subscribers to ascertain the presence of previously developed typologies amongst a broader demographic group. The different types of relationships to animals identified were *Utilitarian* (concern for material value of animals), *Naturalistic* (affection for wildlife and nature), *Ecologistic* (systems concern that relate to relationships between wildlife and nature), *Aesthetic* (interest in symbolic value of animals), *Humanistic* (strong affection for individual animals especially those domesticated), *Moralistic* (concern about exploitation and cruelty towards animals), *Scientistic (sic)* (interest in the biological functioning of animals), *Dominionistic* (mastery and domination over animals), *Negativistic* (active avoidance of animals), and *Neutralistic* (indifference and lack of interest towards animals). This study would have benefited from using personality, values, worldviews, and affective connectedness to nature as a framework for determining how these concerns are shaped within the cognitive and intrinsic framework of individuals. Including these aspects of individual psychological processes would have added a deeper understanding of potential mediating factors that might influence attitudes towards animals. Furthermore, conducting a qualitative exploration might have benefitted the study in determining what kind of life experiences and upbringing shape or contradict the relationship that individuals have with animals.

Teel and Manfredo (2010) identified four types of relationships that individuals have with animals based on value orientations towards wildlife and domination versus mutualism worldviews. The *Traditionalist* had a general attitude of mastery and they valued humans over wildlife. The *Pluralist* was split between mutualism and domination. The *Mutualist* had egalitarian values and scored low on power. They viewed wildlife as deserving of rights and protection. The *Distanced* was emotionally disconnected from wildlife issues. This study might have benefitted from ascertaining the degree of affect these individuals have towards animals and nature and how that interacts with their behaviour, personality, and attitudes towards animals. The inclusion of these constructs would have provided a deeper and more meaningful typological explanation when explored within the background of individuals' lives and fears. Without understanding context out of which relationships manifest, strategies risk being poorly targeted with messaging that lack efficacy.

Exploring typologies specifically related to animals is valuable but these typologies did not include personality, affective connectedness to nature, behaviour, used a single method, and did not use typologies to build theory or systems. As a consequence, the typologies are too simplistic and lack exploration of deeper psychological processes that might be required for strategic micro campaigns and advocacy approaches. Simplistic typologies that fail to expand on identified relationships in the context of individual contexts and constructs risk impacting intervention efficacy.

2.5.4.6 Eco-tourism typologies

Although eco-tourism typologies (ET) explore a specialised type of relationship with the biosphere, they can help understand individual travel behaviour. Two emergent typologies worth evaluating are the typologies developed by Cini et al. (2012) and Gupta and Chopra (2014).

Cini et al. (2012) identified five types of eco-tourists in Italy using holiday motivations, personality, values, environmental beliefs, worldviews, and behaviour. They identified *Post-modern tourists*, *Wellness tourists*, *Unconventional tourists*, *Vacationer tourist*, and *Ecotourists*. The *Post-Modern* typology thrived on conformism and social recognition as well as needed fun, wellbeing, and adventure. The *Wellness* typology felt wellbeing was important. The *Unconventional* tourist did not care about conformity and social recognition. The *Vacationer* tourist wanted to have fun and escape and didn't care much about personal wellbeing, belonging, or loneliness. The *Ecotourists* valued knowledge and discovery and had openness to experiencing other cultures and other ways of living with the natural environment. This study provides an indication of the underlying motivations for travellers but would have been more valuable if it had included an exploration of their relationship with the biosphere and the associated affect. Understanding this nexus might have provided insight as to the importance of their underlying motivations (such as biodiversity protection) and the individual experiences for people who travel.

Gupta and Chopra (2014) identified three types of eco-tourists namely *Eco-visionaries*, *Environment Conservators*, and *Wastage Avoiders* based on their pro-environmental behaviour: switching lights off when leaving a room, disposing of garbage, protecting plants, saving water, reuse and recycling, eco-wise purchasing, using own shopping bags, use of public transport, reduce fuel use, and volunteering. The *Eco-visionaries* and *Wastage Avoiders* had the highest scores on pro-environmental behaviour. The exploration of behaviour without a full understanding of the psychological processes that motivate behaviour only allows for a superficial understanding of tourists. This study would have benefitted from exploring underlying values and worldviews related to their behaviour and what that means for their travel choices.

Eco-tourism typologies are specific and simplistic and lacked including more complex processes that could impact the way in which tourists behave. This is problematic in that it does not provide a full typological profile that describes underlying motivations that are the actual drivers of behaviours, choices, and motivations. Without a full understanding of these, communication strategies might be ill-informed and poorly targeted.

2.5.4.7 Policy typologies

Policy typologies (POL) are rare. A policy review study conducted by Osherenko (1992) investigated how policy interprets development in the context of the human-nature nexus. The methodology used by the study is a review of literature related to policies. Based on this review six typologies emerged: the *Conquest and Colonisation* typology that included an exploitative focus to benefit individuals economically. *Balanced Development* typology that included the understanding that there was a need

for balance between Arctic populations and resource use, but environmental protection could not be at the expense of employment. This typology viewed humans as separate from nature and nature was seen as a resource. The *Sustainable and Regenerative* Development typology had a future-centric approach that acknowledged interconnectedness between environmental compromise and economic health. *Rational Ecology* was a typology that focused on the environment more so than on developmental needs. This typology viewed humans as problem-solvers and called for a symbiotic relationship between the environment and humans. The *Ecofeminist* typology considered the oppression of women and destruction of nature as connected and called for a return to the view of interconnectedness and rejection of domination in any form. The *Indigenous Perspective* typology was rooted in animism and symbolic meanings associated with nature. This type viewed the existence of collaborative reciprocity between humans and animals.

This policy typology shows a unique way in which typologies can be developed but it lacks empirical support for the conclusions made. This is problematic in that the typologies formed were not based on an empirical exploration with individuals and might have missed other emergent types of individuals with varying motivations. These typologies would benefit from an empirical investigation that looks at including values and worldviews in order to provide a deeper understanding of the views held by the constructed types.

2.5.4.8 Green marketing typologies

Green marketing is a field in which typologies (GRM) are often used. The two typologies to be discussed are those developed by Awad (2011) and Balderjahn et al. (2018).

A green marketing study (Awad, 2011) identified four typologies using ecological consciousness and purchasing behaviour. The *Green* typology consisted of individuals who showed environmental consciousness, and aimed to live in rhythm with nature and not to have a negative impact. The *Ambiguous* typology had ecological knowledge, yet they were behaviourally disconnected from what they knew. They tended to view the government as responsible for the wellbeing of nature. The *Undevoted* typology was unconcerned about the environment, and their behaviour was environmentally reckless. They had a low understanding of environmental issues, and they didn't perceive their behaviour as necessary for improving the environment. The *Explorers* typology had high ecological consciousness, positive attitudes towards the environment and pro-environmental behaviour. They were willing to sacrifice economics for better environmental purchases. Although this study provides an idea of the nature-nexus expressed, it would have benefited from including intrinsic individual measures to enable the reader to understand where these views emerge from and what values they might be congruent with. Through understanding individual detail, such as values, the motivations for their concerns and behaviour would have allowed for a stronger distinction to be made between the *Green* typology and *Explorers* typology since there are currently significant overlaps that might impact the design of strategic communication campaigns.

Balderjahn et al. (2018) developed typologies using beliefs, values, and behaviour and identified six typologies. The *Financially Careless Consumers* were those who showed a disregard for environmental sustainability whereas the *Non-simplifiers* did not value simple living and purchasing was sustainably unconscious. The *Financially Careful Simplifiers* valued financial benefits that came with living simply. They valued power more than they valued self-transcendence and openness to change. The *Socially Conscious financial simplifiers* showed regard for social and economic consciousness. They valued debt-free living but showed low environmental concern. They appreciated benevolence, security and conformity and were more likely to purchase sustainable fashion products. The *Sustainable non-collaborative consumer* typology valued sustainable consumption and scored high on universalism and self-direction values. The *Sustainable consumers* were the most environmentally conscious consumers; they valued collective consumption, benevolence, universalism, self-direction and stimulation. This study would have benefited from including personality and typology affective relationships with the biosphere in order to indicate underlying sources of motivations and environmental context. Understanding these underlying psychological processes that influence individuals is meaningful in order to effectively target them with interventions or communications.

The green marketing typologies are simplistic and exclude personality, mixed methods, and using typologies to build theory or systems. Disregarding an intrinsic understanding of psychological processes that motivate perceptions, behaviours, and concerns leaves the reader asking why individuals see the world in the manner they describe.

Based on the above typology evaluations this study aimed to use a typology framework that included intrinsic dimensions (demographics, personality, values), cognitive dimensions (worldviews, environmental awareness, concern and attitudes), affective dimensions (connectedness to nature / emotional positionality), and behavioural dimensions (environmental behaviours) with a methodological approach that applied mixed methods to build theory and typological systems.

2.5.5 Gaps in existing typologies

Based on the above evaluation clear gaps in the typological landscape are apparent. These gaps are summarised per typology type in Table 4. These gaps suggest an opportunity to build broader and deeper typologies that are non-linear and that contribute to theory in the field of ecopsychology and climate psychology.

Table 4: Gaps in literature table

	Abbreviation	GW/CC/SS N = 4	POS N = 8	BIO N = 2	BEH N = 5	ANI N = 2	ET N = 2	POL N = 1	GRM N = 2
Intrinsic dimensions	**ID**								

Demographics	*ID/D*	✓✓✓✓	✓✓ ✓✓ ✓✓ ✓✓	✓✓	✓✓✓ ✓✓	✓✓	✓✓	✓	✓✓
Personality	*ID/P*	✗✗✗ ✗	✗✗ ✗✓ ✗✗ ✗✗	✗✗	✗✗✗ ✓✗	✗✗	✓✗	✗	✗✗
Values	*ID/V*	✓✓✓✗	✗✗ ✓✓ ✓✓ ✗✗	✓✗	✗✗✗ ✗✗	✗✓	✓✗	✗	✗✓
Cognitive dimensions	**CD**								
Worldviews	*CD/W*	✓✗✗✗	✓✗ ✓✓ ✓✗ ✗✓	✓✓	✓✗✗ ✗✓	✗✓	✓✗	✗	✗✓
Environmental awareness, concern and attitudes	*CD/A*	✓✓✓✓	✗✗ ✗✓ ✗✓ ✓✓	✗✓	✓✓✓ ✗✓	✓✗	✓✗	✓	✓✓
Affective dimensions	**AD**								
Connectedness to nature / emotional positionality	*AD/CN*	✗✗✗ ✗	✗✓ ✓✗ ✓✓ ✓✓	✓✓	✗✗✗ ✗✓	✗✗	✗✗	✓	✓✗
Behavioural dimensions	**BD**								

Environmental behaviour	*BD/B*	✓✓✓✓	✗✗ ✗✓ ✗✗ ✓✓	✗✗	✓✓✓ ✓✓	✗✗	✓✓	✗	✓✓
Methodological approach	**MA**								
Mixed – singular method	*MA/M*	✗✗✗ ✗	✗✗ ✗✓ ✓✓ ✗✗	✗✗	✗✓✓ ✗✗	✗✗	✗✗	✗	✗✗
Using typologies to build theory	*MA/T*	✗✗✗ ✗	✗✗ ✗✗ ✗✗ ✗✗	✗✗	✗✗✗ ✗✗	✗✗	✗✗	✗	✗✗
Designing typologies as systems	*MA/S*	✗✗✗ ✗	✗✗ ✗✗ ✗✗ ✗✗	✗✗	✗✗✗ ✗✗	✗✗	✗✗	✗	✗✗

✗ - Construct not included in typological development

✓ - Construct included in typological development

The gaps show that there were no typologies that aimed to explore the human-nature nexus in developing countries and more specifically in Africa. Most of the typologies constructed were in the USA with some work extending into Asia and Europe (Metag et al. 2017). Furthermore, very few include multiple variables during the construction of their typologies and none of the typologies investigated used typologies as theories or systems. Linear approaches (i.e. single-method studies and limited variables assuming unidirectionality in the relationships) are inadequate for understanding the complex relationship individuals have with the biosphere (Ingulli & Lindbloom, 2013). Understanding complexity and underlying psychological processes (often shaped by life experiences) allows for a fuller understanding of behavioural motivations in individuals (Kollmuss & Agyeman, 2002). High levels of complexity of the human-nature phenomena under investigation has driven researchers to include isolated variables, as opposed to systems of interrelationships among clusters of variables (Parkhe, 1993).

Only one positionality study (Pike et al., 2008), one behavioural study (Poškus & Žukauskienė, 2017), and one eco-tourism study (Cini et al., 2012) included personality in their list of variables. Intrinsic variables such as personality provide insight into unconscious processes (LeBaron, 2003). Since personality is a relatively stable individual trait it helps to understand how an individual interprets the world (Dittmar et al., 2014). Personality influences a person's worldview choice (Bjorkqvist et al., 1994), helps them understand environmental views (Morton et al., 2011; Wiseman & Bogner, 2003), and shapes ideologies (Stanley & Wilson, 2019). Therefore, personality has the ability to explain how individuals form beliefs and attitudes that impact on values, relationships, and behaviour (Kajonius et al., 2015; Poškus & Žukauskienė, 2017).

Behaviour or values are limited in their scope. For example, Leiserowitz et al. (2009) only looked at energy-efficient practice in their typology construction, and values often include those that range between domination and mutualism (Teel & Manfredo, 2010) rather than a variety of universal values (Schwartz, 2009). The problem with using a narrow conceptualisation of values is that they are not able to provide insight into the broad range of issues individuals might feel are important. There is also a lack of focus on individual contexts (Poortinga & Darnton, 2016) using qualitative exploration. Without providing context through exploration for individual typologies they do not contribute a nuanced understanding of the human-nature nexus.

Typologies that only include a single topic are less useful to policymakers and practitioners. Aspects explored are often superficial and lacking in psychological depth (Buford, 2009; Wicker, 1989). Mainstream psychology fails to account for complexities in human behaviour when it comes to climate change due to limited methodological approaches and using a small number of variables. The field of climate and ecopsychology requires creative approaches to gain a deeper understanding of the human nature-nexus (Andrews & Hoggett, 2019). This study aims to address these superficial understandings of the human-nature nexus through the inclusion of multiple variables showing a network of relationships (McKinney, 1969), using methodological complexity, and contributing to ecopsychological and climate change theory. This research will show that the human-nature nexus needs to be understood using systems thinking.

2.6 Systems thinking

Systems thinking, traditionally a concept used in the natural sciences, has been extended into humanistic psychology and later integrated into ecopsychology. This extension comes naturally as both psychologies are opposed to linearity, mechanistic thinking, and reductionist models (Krippner, Ruttenber, Engelman, & Granger, 1985; Roszak, 1992). A system is a set of people, cells, or molecules that interconnect in a manner that produces its pattern of behaviour (Meadows, 2008). External events impact a system and the same events affecting a different system will create a different result. They are complex structures that have various non-linear interconnections that respond adaptively, energetically, and intentionally, with the aim to self-preserve (Meadows, 2008). Laszlo and Krippner (1998) define a system as *"a complex of interacting components together with the relationships among them that permit the identification of a boundary-maintaining entity or process"* (p. 7). Since systems deal with

relationships, they can provide insight into the theory of the human-nature nexus through simplification of this complex phenomenon (Laszlo & Krippner, 1998). Systems thinking will allow for a deeper understanding of the complexity in the human-nature nexus as well as the interrelations between constructs and dimensions (Ingulli & LIndbloom, 2013).

2.6.1 Using systems thinking to understand the human-nature nexus

A systems model can be used to understand the human-nature nexus using humanism as a primary boundary and the biosphere as a secondary boundary (Midgley, 1994). Humanism is described as anthropocentric in that it represents boundaries that prioritise humans. The biosphere is an ecological concept and is based on the premise that humans are not the center of importance (Midgley, 1994). Therefore, when the prioritised boundary is always human, then anything beyond that boundary will be marginalised and subject to abuse (Beattie, 2013). The existence of marginalised boundaries might reinforce the necessity of the prioritised boundaries making it important to understand what types of boundaries exist within the system and their associated meaning. When opposing moral components drive primary and marginalised boundaries, tensions are created and the system could morally disengage to deal with the tension (Bandura, 2007). Also, when marginal elements are treated as irrelevant, elements within the primary boundary become prioritised by implication, and the associated internal ethic is reinforced (Midgley, 1994). When marginal elements become prioritised the primary boundary becomes marginalised and the secondary boundary then becomes the primary boundary, which would be the case in an individual that has an ecological worldview. System boundaries are impacted by system history and interaction between system elements and are therefore dynamic, complex, but not absolute (Luckett, 2004; Midgley, 1994). Best (2012) uses systems thinking to illustrate the moral progress that society is making when it comes to animal liberation where, for example, boundaries such as slavery were prioritised but as society progressed this now has a marginalised or profane status. Figure 1 shows how this thinking moves from context, to individual constructs, to a system dynamics understanding within the study.

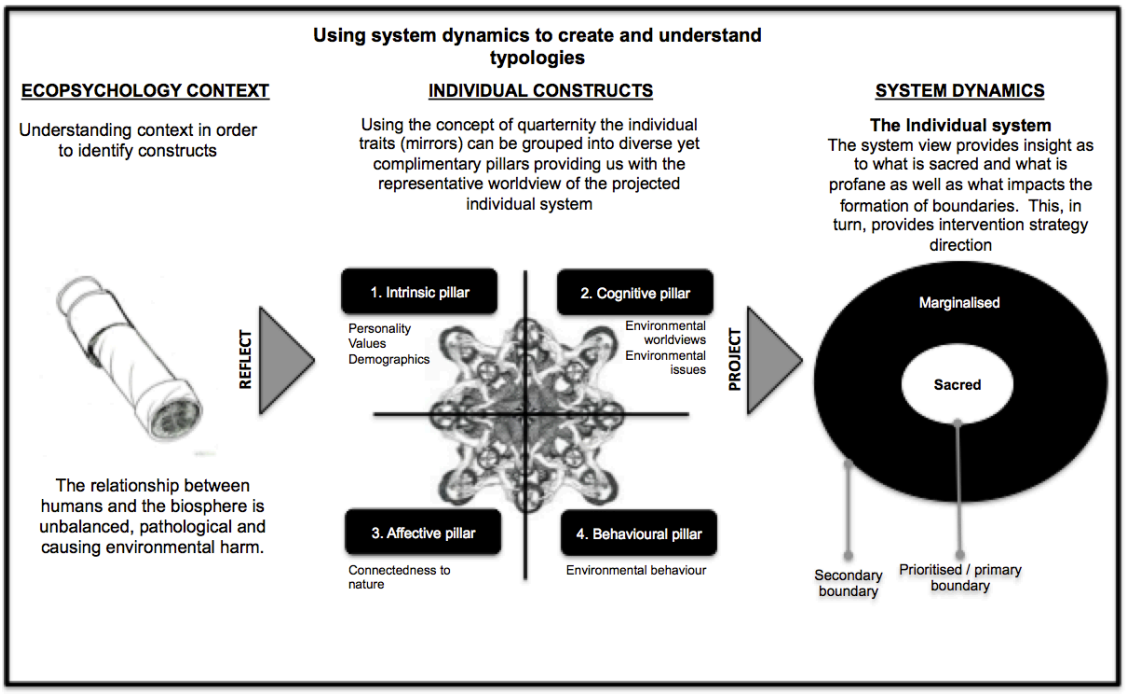


Figure 1: Moving from individual constructs to systems dynamics

*Above graphic designed by researcher.

Understanding the system boundaries is essential, but one also needs to understand how the system runs itself. Feedback loops are a method used by the system to run itself (Capra, 1996). They can operate in two directions and can be demonstrated through systems diagrams. There are two types of feedback loops, namely balancing feedback loops (i.e. negative feedback) that aim for stability and reinforcing feedback loops (i.e. positive feedback or triggers) that enhance an existing function. Emergent properties are another critical element of systems thinking. Although a system is a whole, it has emergent properties that are a set of unique characteristics that form and "emerge" from the system (Laszlo & Krippner, 1998). A systems approach is inherently intuitive, pragmatic, and often involves heuristics (Laszlo & Krippner, 1998). Systems models in particular use strategies for simplification of the inherent complexity in relationships, in order to allow for understanding of the processes and system dynamics involved in the functioning of the system (Meadows, 2008).

2.7 Summary

In summary, the field of ecopsychology is well poised to explore and address the environmental crisis, as it is a systems psychology that deals with the affective relationship between humans and the biosphere. Although the field has many theories and hypotheses, it lacks theory based on empirical investigation of the human-nature nexus. Furthermore, there is a lack of research that investigates the human-nature nexus in South Africa with most typologies conducted in developed countries. Typologies are an effective way to understand complexity, but there is a gap in the existing typology construction as they tend to ignore the theory building and systems design opportunities inherent in typology construction. Chapter 3 describes a systems development methodology that aims to explain how typologies will be identified, their differences explored and how ecopsychological theory will be built using systems thinking.

2.8 Research aim, purpose and questions

The study aims to build typologies and construct ecopsychological theory. This will be done through a layered discovery of emerging properties of complex, multi-factorial relationships, and descriptions of them. The use of typologies, as complex systems, allows for a nuanced understanding of the human-nature nexus.

Therefore, the primary purpose of the study is to gain an in-depth and nuanced understanding of types of people and their relationship with the biosphere. Lertzman (2015) calls this approach a compassion-based strategy that can only be well informed when acknowledging individuals as complex systems. People are different, and therefore strategies need to meet types of people where they are psychologically in order to be effective (Lertzman, 2015). Understanding different types of people allows for informed environmental policy development (Dalal-Clayton & Bass, 2009), green technology development and adoption, therapeutic interventions, pedagogical approaches, and marketing efforts (Dwyer et al., 1993; Maibach et al., 2009) in South Africa.

2.8.1 Research questions

1. Based on people's relationship with the biosphere and individual differences, which typologies exist in South Africa?

   In order to build emerging typologies (types that do not exist currently) they first needed to be identified quantitatively through cluster analysis, based on the extent individuals differ in terms of their affective relationship with the biosphere as well as other identifying variables. The remaining variables was then be used for profiling typologies that would heighten the understanding of inter-group similarities and between-group differences (Collier et al., 2008). It was important to first identify the typologies quantitatively, in order to build a statistically sound structure for subsequent theory building and systems design.

2. How do typologies differ from each other?

   The quantitative cluster analysis provided insights into how typologies might be different from each other, but in order to build depth and theory, the study included in-depth interviews that explored individual experiences, contexts, nature relationships, and thoughts about climate change. Qualitative exploration is typically part of grounded theory analysis used for theory building but is also imperative for gaining a deeper understanding of the underlying psychological processes that influence why the typologies emerged during the cluster analysis. This stage of the study was important as it aimed to explore how typologies differed from each other, not only statistically, but also psychologically as they include individuals interacting in the world with various emergent contexts.

3. What typologies describe South African individuals' reported relationships with the biosphere and how are these types explained through experiential accounts?

   After identification of the types, the study explored how the types could be further understood through experiential accounts. This deeper exploration and analsysis allowed for the emergence of

narrative trends that enhanced the understanding of a particular type, and how these individuals might be different or similar to other types.

4. What ecopsychological theory can be developed to describe each of the identified typologies?
   Psychology often ignores the intricate relationships and influences nature has on the human psyche and has treated human interactions as taking place in a vacuum rather than humans as being in and dependent on natural processes, impacting the health of the environment and vice versa (Yunt, 2001). This study aimed to address a gap in understanding the complex human psyche within a complex natural world and how this impacts affective connection to nature that ultimately impacts the way people behave towards the environment and how ecological issues manifest through their psyche and their lives. Building theory and systems naturally follows an explanatory, sequential, mixed-methods design such as this. Theory and systems thinking was able to show the relationships that influence the way in which people think and behave and aimed to contribute new theory to the field of ecopsychology.

CHAPTER 3

METHODS

3.1 Introduction

The overall aim of the study was to identify and describe the different types of relationships middle to higher income individuals (Visagie, 2013) have with the biosphere since, they are likely to have the highest carbon footprints and have more flexibility in making changes to their lifestyles and behaviour. This study makes use of a mixed methods design incorporating a range of variables to address the identified gaps. This chapter describes the methodological approach starting with the research aim and objectives, an explanation of the design, followed by a description of the eight-stage systems model for mixed methods process that was followed. The eight stages of the process include measurement design, quantitative data collection, quantitative analysis and description, linking, qualitative exploration, qualitative analysis, qualitative validation, and building systems.

Figure 2 below shows the methodologies the researcher identified to answer each of the research questions.

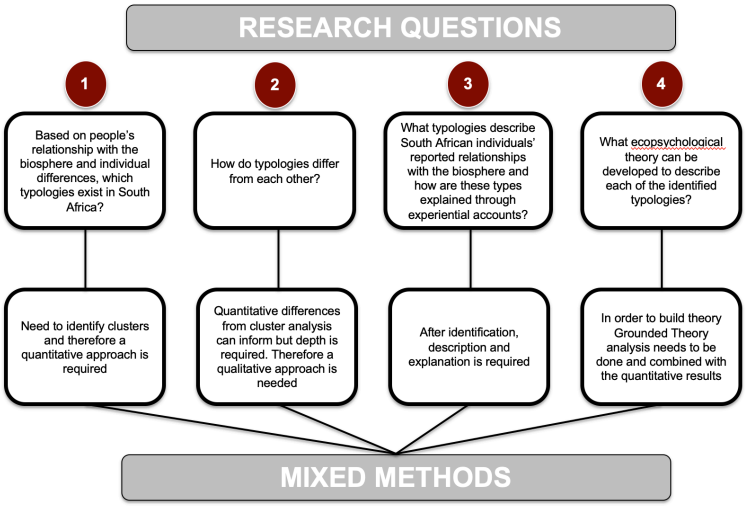


Figure 2: Identifying the methodology required to answer research questions

A mixed method approach (Creswell, Plano Clark, Gutmann & Hanson, 2003) was required to answer the research objectives. In order to identify which typologies exist in South Africa, based on variables that measure the relationship to the biosphere and individual differences, a quantitative method seemed appropriate. To answer the second research question (i.e. to gain an in-depth understanding of how typologies differ from each other), there was a need to use a qualitative approach. The results from both methodologies combined aimed to answer the third research question that is what typologies describe South African individuals' reported relationships with the biosphere and how are these types explained through experiential account. The fourth research question of what ecopsychological theory can be developed about the identified typologies was also answered through combining the grounded theory

results and the quantitative results. Therefore, an explanatory, sequential, mixed methods design was used.

3.2 Explanatory sequential mixed methods design

The use of mixed methods, combining quantitative and qualitative research, has increased in legitimacy and use (Clark, Creswell, Green, & Shope, 2008). There are four main types of mixed method designs namely; triangulation, embedded design, exploratory, and explanatory design. Triangulation is a comparative method, which compares results that emerge from the quantitative and qualitative phase and an embedded design is when the qualitative results aim to enhance the quantitative findings with one method treated as a priority. An exploratory design aims to generalise the qualitative results. An explanatory design starts with the quantitative phase and can help to identify participants for the second phase. The qualitative phase is used to explain, elaborate, or refine the quantitative results (Clark et al., 2008). An explanatory sequential mixed methods design was used to identify typologies, describe them, and build theory.

There are many benefits to using a mixed methods approach. They allow the researcher to explore different perspectives of the same phenomenon for a fuller understanding (Todd, Nerlich, & McKeown, 2004), building theory, increasing methodological rigour, providing a corroborated conclusion, and for incremental knowledge production (Clark et al., 2008). The primary benefit for the purposes of this study was the robustness of design in its ability to identify and describe complex phenomena, using the first phase to identify participants for the second phase (Fetters, Curry, & Creswell, 2013), and to use the cumulative insights to build theory that explains the relationship people have with the biosphere (Ivankova, Creswell, & Stick, 2006). Some of the challenges in using this design are not knowing which phase of the study is dominant, the complex data analysis and integration process, it is time intensive, and the difficulty of finding coherence when analysis takes place at both an individual and typological level (Creswell, 2003). The major challenge in using this approach is that a mixed method design has been said to be epistemologically paradoxical (Morgan, 2007).

3.2.1 Epistemological paradoxes of a mixed methods design

A mixed methods approach is epistemologically paradoxical because the ways of knowing between quantitative and qualitative approaches are incongruent. The epistemological positioning of quantitative research is positivistic and typically makes use of a survey to collect data through predetermined instruments and subsequently provides statistical results (Creswell, 2003). This approach is reductionist, logical, empirical, and deterministic (Creswell, 2003). Qualitative research consists of textual materials such as interview transcripts, field notes, and artifacts (Saldaña, 2011) and is constructivist in that participants are seen to be the co/creators of knowledge and emergence is key to understanding (Holstein & Gubrium, 1995; Levers, 2013; Morgan, 2007). Due to these paradoxes a different epistemological approach was needed for this study.

Pragmatism is philosophically uncommitted and is therefore ideal for this study (Bryman, 2007). A pragmatic approach finds solutions to the problems, provides freedom to choose methods that suit the requirements of the study, the world is not seen as pure unity, there is an understanding that the

research takes place in various contexts such as political, cultural, and social and that questions should not be about a fixed reality but rather be ontologically studied in the context of multiple realities expressed by participants (Creswell, 2003). Morgan (2007) describes pragmatism as being abductive, inter-subjective, and transferable compared to a purely quantitative approach characterised by deduction, objectivity and generality, versus a purely qualitative approach that is characterised by induction, subjectivity, and context. Therefore, a pragmatic epistemology was appropriate when dealing with a systems model for mixed methods that uses both deduction and induction. The following section aims to unpack the systems model for the mixed methods process used in the study.

3.3 Systems model for mixed methods process

A systems model provided the study with a pragmatic design and process that could deal with data generation needed for both complexity and dimensionality inherent in the building of typologies and subsequent theory. The systems model for mixed methods process was based on the criteria for mixed method model development provided by Ivankova et al. (2006) and suggests treating both sets of data as equally illuminating. The systems approach for this study was characterised by circularity, compared to the linear process demonstrated by Ivankova et al. (2006) and moved from a deductive process to an inductive one.

The deductive process started with measurement design that included identifying constructs to include in the survey battery (appendix 12). The second part was the quantitative data collection and included identifying a data collection tool, participant sourcing, piloting the questionnaire and considering fieldwork ethics with the outcome of numeric data. The third step in the process was the quantitative analysis that included descriptive analysis, scoring, factor analysis, cluster analysis/ profiling, post-hoc tests, and discriminant analysis. The outcomes of the final stage of the quantitative research were the typologies and linking of participants to a typology for use in the qualitative phase recruitment.

The inductive process started with the qualitative exploration done by conducting 44 in-depth interviews in Cape Town, Durban, and Johannesburg with representatives of the typologies identified in the quantitative phase. The outcomes of this part of the study were a fieldwork journal, cluster maps, as well as anonymised verbatim transcripts for each of the interviews. After that, qualitative analysis took place using Grounded Theory, a constant comparison technique, and analytical memo-ing and coding. Grounded Theory is an interaction between induction and deduction (Strauss & Corbin, 1998) and therefore the outcome was typological theory. Next was the validation of the qualitative analysis and consideration/integration of the feedback that emerged from a Grounded Theory audit and member checking. Finally, the deductive and inductive results were integrated to build systems using multidimensional scaling (MDS) and linking. The outcome of this phase was joint displays that demonstrated both the typological systems and associated theory. The entire research process is represented graphically in Figure 3.

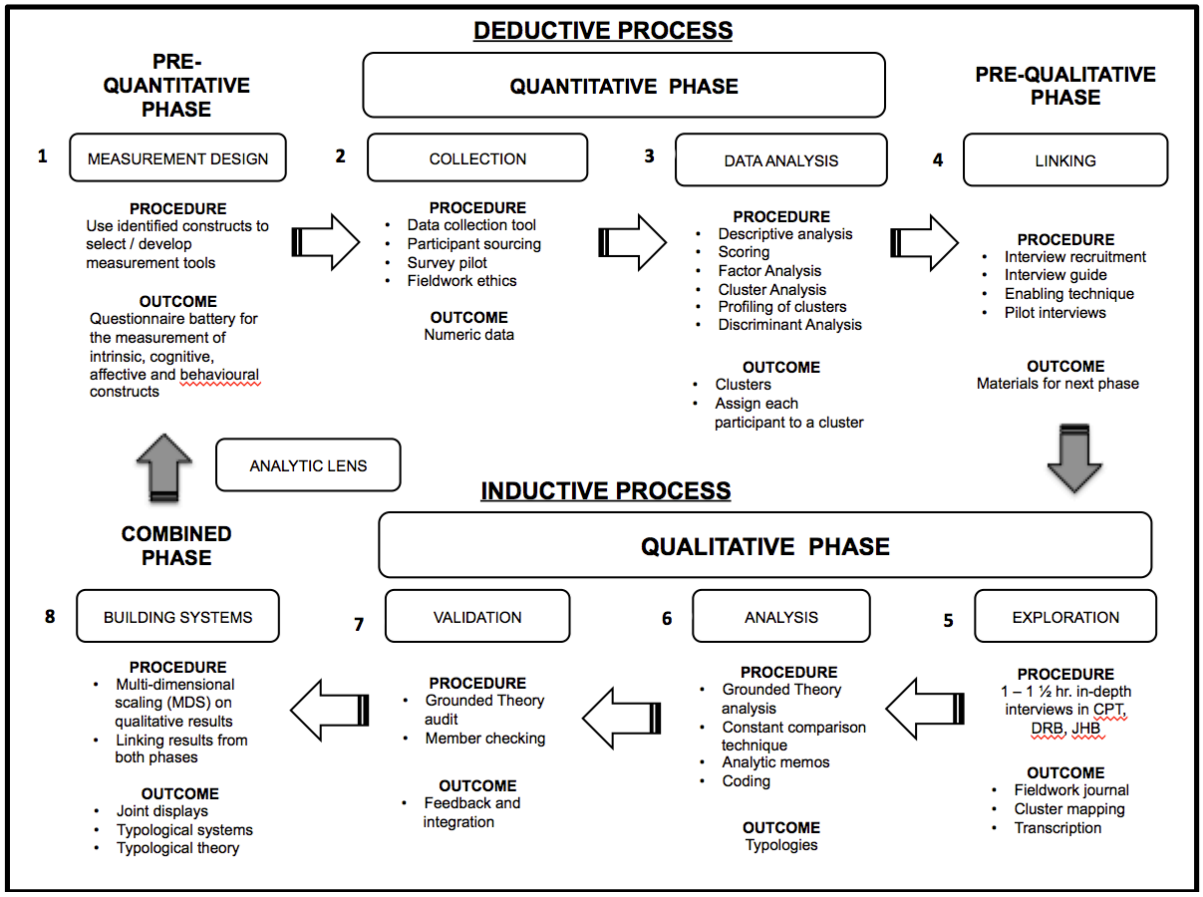


Figure 3: Systems model for mixed methods process adapted from Ivankova et al. (2006)

The following sections explain each step in the process as depicted by the above systems model for mixed methods process.

3.3.1 Quantitative phase

3.3.1.1 Measurement design

A multi-structural framework is useful for identifying individual differences to build typologies that explain their relationship with the biosphere. Four useful multi-dimensional constructs (see Table 5) emerged from the literature: intrinsic, cognitive, affective, and behavioural constructs (De Witt & Hedlund, 2013; Koltko-Rivera, 2004). The intrinsic construct includes stable and to some extent, unconscious individual traits: demographics, values, and personality (LeBaron, 2003). The cognitive construct includes worldviews (Lacroix & Gifford, 2018) and issues individuals experience as concerning (World Economic Forum, 2014). The affective construct seeks to understand how the individual feels and what they include in their perception of the natural world (Mayer & Frantz, 2004). For some, this affective component could include a feeling that the natural world is something “out there” and in which humans have no part. This position is also called sensory shutdown, hyper-reflexivity, objectification, normotic illness, and self-exile (Puhakka, 2014) or the paranoid-schizoid position (Baker, 2013). Although understanding the affective connection to nature is in no way a binary approach, the other side of the spectrum could be called intimacy, intersubjectivity, or the porous self-other boundary (Herbert, 2014). Lastly, the behavioural construct allows for understanding the behavioural trends of the individual in as much as how they claim to be living daily (Defra, 2008). Currently, there is a lack of systematic

coherence in the fields of psychology, ecology, and ecopsychology when it comes to treating individuals as complex systems or typologies and attempting to understand their interrelationships with nature using multiple constructs. Table 5 shows these multiple constructs, dimensions, measures and variables that were identified as meaningful. The constructs are the overarching themes; the dimensions are the individual elements, and then there is the psychometric measure with associated variables.

Table 5: Multiple constructs, dimensions, measures and variables used

Construct	Dimension	Measure	Variables	References
Intrinsic	Demographic	*Demographic Questionnaire (DQ)	Geographical location, age, gender, population group, religion, English competency, education level	Gifford and Nilsson (2014) Schwartz (2009)
	Personality	Jung Type Indicator (JTI)	**Attitudes**: Extraversion, Introversion **Psychological functions**: Sensing, Thinking, Feeling, Intuiting **Auxiliary processes**: Judging, Perceiving	Dittmar et al. (2014) Hirsh (2010) Kaiser and Byrka (2011) Sabini (2008)
	Values	Schwartz Value Survey (SVS)	Power, Achievement, Hedonism, Stimulation, Self-Direction, Universalism, Benevolence, Tradition, Conformity and Security	Corner et al. (2014) Hahnel et al. (2014) Hurst et al. (2013) Kasser (2013) Schwartz (2006, 2009)
Cognitive	Worldviews	New Ecological Paradigm Scale (NEP)	Dominant Social Paradigm (DSP) versus Ecological Paradigm (EP)	Dunlap (2008) Lewis (2009) Schultz et al. (2004) Tauber (2012)
	Environmental Awareness, Concern and Attitude Dimension	*Environmental Issues and Attitudes Questionnaire (EIAQ)	General issues, environmental concerns, environmental accountability, animal concerns, animal accountability, attitudes	Anand (2013) Dunlap and Jones (2003) Midgley (1994) Swim et al. (2009) World Economic Forum (2014)
Affective	Connectedness to nature	Connectedness to Nature Scale (CNS)	Degree of connectedness to nature	Beery and Wolf-Watz (2014) Macy and Brown (2014) Ojala (2012)

				Roszak (1992) Semenya (2013)
Behavioural	Environmental behaviour	*Behavioural Questionnaire (BQ)	Waste, transport, energy, purchase and consumption behaviour, water, general	Berndt and Gikonyo (2012) Herzog et al. (2005) OECD (2008) Zarepour (2012)
* Researcher developed questionnaires				

3.3.1.1.1 Demographic measure

Gathering demographic information through a Demographic Questionnaire (DQ) assisted in profiling typologies, drawing valuable links between other typological constructs and also functioned as a tool for sampling during the qualitative phase of the study. The demographic questionnaire included the following: city, age (being under 18 years old was an exclusion criterion for the study), gender, population group, religion and degree of religiosity, home language, English competency, growing up the number of living persons in household, growing up the living size of town/city, education level (participant, mother, father), occupation status, occupation type, personal income, household type, household area, relationship and living status, living status in household, children in house, age of children in house, purchasing responsibility.

3.3.1.1.2 Personality measure

The Jung Type Indicator (JTI) was used to measure personality using sixty items. The JTI is a personality assessment instrument developed using Jung's typological model. The JTI identifies individual Psychological Types based on attitudes (Introversion and Extraversion - EI) and functions (Sensing, Intuiting – SN; Thinking, Feeling - TF) (Sharp, 1987). According to Stein (1998), Jung argued that the ego has an innate, genetic propensity to prefer one particular type of attitude and function combination and to rely secondarily on another complementary combination for balance, with a third and fourth remaining peripheral and consequently less available and developed. In addition to measuring attitudes and functions, the JTI also includes two secondary processes to help ascertain which functions are dominant and conscious, versus which are auxiliary and unconscious. The secondary processes are Judging and Perceiving (JP). The Judging process is characterised by the need to have structure in their world and to use that to regulate their mental events. The Perceiving process constitutes the receipt of information without evaluation (Jung Type Indictor Manual, Psytech).

The JTI has a high level of internal consistency (reliability) reported across samples ranging from .83 to .88 (EI), .78 to .86 (SN), .75 to .84 (TF) and .75 to .85 (JP). Furthermore, the subscales of the JTI show very high levels of test-retest reliability at .72 (EI), .82 (SN), .87 (TF) and .82 (JP) (Jung Type Indicator Manual, Psytech). The Jung Type Indicator Manual (Psytech, 1998) reports that the inter-correlations between the subscales are small and therefore demonstrates that independent characteristics are being measured. Furthermore, Psytech reports that each of the JTI items load on the appropriate factor indicating good internal structure of items in the test.

The rationale for using the JTI compared to other personality or temperament questionnaires is that the four dimensions, when linked to the other variables being tested would assist in building and understanding the typologies as systems. The Meyers Briggs Type Indicator (MBTI) is also based on Jung's theory and therefore it is important to point out the differences between these two instruments although overall correlations between the MBTI and JTI indicate that the two scales are measuring dimensions that are identical (Jung Type Indicator Manual, Psytech). While the MBTI is better known and more widely used, for this study the JTI was used due to the following reasons: JTI uses modern psychometric test theory (identifying preferences across four dimensions rather than using a dichotomous model); the JTI interprets psychological types as being best described by points on a continuum, rather than discrete categories, and the JTI was sponsored by Psytech for use in this study (Jung Type Indicator Manual, Psytech). Unfortunately due to the proprietary nature of the measure, individual items were not available for this study, so no Cronbach alphas could be calculated.

3.3.1.1.3 Values measure

The Schwartz Value Survey (SVS) was the first instrument developed to measure values based on theory (Schwartz, 2012) and is now the most widely used values survey by social and cross-cultural psychologists for studying differences between individuals (Agle, Hart, Thompson, & Hendricks, 2014). This instrument has been found to be adequate for research across cultures (Knafo, Roccas, & Sagiv, 2011; Spini, 2003; Strack & Dobewall, 2012), and permission was obtained from the developer for use in this study.

The Schwartz Value Survey (Schwartz, 2009) measures values of Power, Achievement, Hedonism, Stimulation, Self-Direction, Universalism, Benevolence, Tradition, Conformity, and Security (Fischer & Schwartz, 2011; Schwartz, 2011) and is based on his universally relevant theory of human values (Becker et al., 2017). The scale asks participants to rate the importance of 57 specific values as "guiding principles in your life" and these then measure ten, theory-based value orientations. The first list contains 30 items that explain potentially desirable end-states in noun form and the second list contains 27 items that describe potentially suitable ways of acting in adjective form. Participants then rate the importance of each value item "as a guiding principle in my life" on a 9-point scale labeled 7 (supreme importance), 6 (very important), 5 and 4 (unlabeled), 3 (important), 2 and 1 (unlabeled), 0 (not important), -1 (opposed to my values) (Schwartz, 2007). The score for each value is the mean of the ratings given to the items listed for that value. Schwartz (2009) suggests making corrections for individual differences in the response scale in order to ensure accurate conclusions are made from the results.

The SVS has acceptable reliability reports. Across 212 samples, alpha reliabilities of the 10 values average .68, ranging from .61 for Tradition to .75 for Universalism (Schwartz, 2006). Reliability testing of the SVS in Australia, Holland, Israel, and Japan showed reliabilities of .67, .68, .71 and .60 respectively. In a South African study the Cronbach's alpha were .76 for Benevolence, .78 for Universalism, .65 for Self-direction, .63 for Stimulation, .62 for Hedonism, .65 for Achievement, .63 for Power, .60 for Security, .71 for Conformity and .58 for Tradition (Becker et al., 2017). The Cronbach alphas for this study were calculated using raw scores as was done in the South African study (Becker

et al., 2017) with the C-alpha values showing .72 for Conformity, .68 for Tradition, .70 for Benevolence, .75 for Universalism, .60 for Self-direction, .60 for Stimulation, .64 for Hedonism, .73 for Achievement, .67 for Power, and .60 for Security.

3.3.1.1.4 Worldview measure

The New Ecological Paradigm Scale (NEP) is a cognitive measure (Tauber, 2012) that was developed in 1978 and updated in 2000 (Dunlap, 2008; Dunlap & Van Liere, 1978). It is said to be the most widely used measure of environmental concern (Dunlap & Jones, 2003), awareness of environmental issues (Dunlap & Jones, 2002), or environmental attitudes and worldviews (Hawcroft & Milfont, 2010). The NEP does not measure emotional or physical connections to the natural world (Mayer & Frantz, 2004; Tauber, 2012) and should be combined with a measure of emotional connectedness for a fuller picture. Although the NEP has not been used widely in Africa, a meta-study reported its use in other emerging economies such as China, India, Brazil and Russia (Hawcroft & Milfont, 2010) and a study measuring environmental worldviews in Nigeria (Ogunbode, 2013). Permission was received from the developer for its use in this study.

In this study the NEP was used to measure the degree to which an individual has an ecological worldview (Dunlap & Van Liere, 1978) with 15 items of which 8 measure the Environmental Paradigm (EP) and 7 measure the Dominant Social Paradigm (DSP) (Dunlap, 2008). Participants responded on a 5-point scale, where 1 = strongly disagree and 5 = strongly agree (Dunlap, 2008). The scale consisted of 5 facets, namely the reality of limits to growth (e.g. we are approaching the limit of the number of people the earth can support), anti-anthropocentrism (e.g. humans have the right to modify the natural environment to suit their needs), the fragility of nature's balance (e.g. when humans interfere with nature it often produces disastrous consequences), rejection of exemptionalism (e.g. human ingenuity will ensure that we do not make the earth unlivable), and the possibility of an eco-crisis (e.g. if things continue on their present course, we will soon experience a major ecological catastrophe) (Hawcroft & Milfont, 2010). Although there are these facets, the scale is best used to measure a single construct (Dunlap, 2008). The study in Nigeria yielded an overall Cronbach alpha of .61 and a Cronbach alpha of between .61 to .70 on the facets (Ogunbode, 2013). In this study the facets yielded low Cronbach alphas of between .35 to .56 compared to an overall scale Cronbach alpha of .77 which is similar to those in more developed countries (Best & Mayerl, 2013; Gangaas, Kaltenborn, & Andreassen, 2015; Rideout, 2014). The NEP was used as a single measure within this study due to the low Cronbach alphas on the facets.

3.3.1.1.5 Awareness, concern and attitude measure

In order to understand issues that the individual system prioritises versus those it marginalises (Midgley, 1994) the researcher self-developed a measure of awareness, concern, and attitudes drawing on Anand (2013), Beddoe et al. (2009), Pappas (2008) , Swim et al. (2009), The Earth Charter Commission (2000), and the World Economic Forum (2014) as a relatively inclusive questionnaire that contains both environmental and animal concerns including issues specific to South Africa (i.e. canned lion hunting). It is important to understand the connections between humans and climate change as they are

connected to the relationship individuals have with animals and nature (Swim et al., 2009). A questionnaire that includes all these variables could not be found and as such the researcher developed the Environmental Issues and Attitudes Questionnaire (EIAQ).

The questionnaire contained four sections, namely ranking, environmental (awareness, concerns, and accountability), animal (awareness, concerns, and accountability), and general attitudes. The ranking section aimed to understand issues the typologies are most concerned about: personal safety, economic, social, religious, environmental, health, political, animal rights, and international tensions. The second and third sections explored the level of awareness on a 4-point scale where 0 = I don't know, 1 = I am now less aware than before, 2 = My awareness is the same as before, 3 = I am more aware than before of environmental problems in section 2 and animal rights issues in section 3. The second part of these two sections then explored the degree of concern about specific environmental versus animal issues on a 6-point scale where 0 = No opinion, 1 = Not at all concerned, 2 = Slightly concerned, 3 = Somewhat concerned, 4 = Moderately concerned, 5 = Extremely concerned. The last part of these two sections contained an accountability question for all items that received a concerned rating of 3 or 4 asking the participant the extent to which they felt they had control (locus of control) over the items they were concerned about on a 4-point scale where 0 = I don't know, 1 = I have no control over this, 2 = I can maybe change something small or help in a small way, 3 = What I do could have a direct impact. The final section in the questionnaire explored attitudes towards the environment, domestic animals, farm animals, wild animals, and general topics on 6-point scale where 0 = Don't know, 1 = Strong disagree, 2 = Disagree, 3 = Neither agree or disagree, 4 = Agree, 5 = Strongly agree. After data were gathered the EIAQ data were subjected to a data reduction process using Factor Analysis to identify emergent themes. This is described in this Chapter, Section 3.3.1.3.5.1.

3.3.1.1.6 Affective measure

The Connectedness to Nature Scale (CNS) (Mayer & Frantz, 2004) aimed to measure an individual's affective and experiential connection to nature and is linked to Leopold's (1948) vision that connectedness to nature includes feelings such as a sense of community, kinship, egalitarianism, embeddedness, and belongingness to nature. The scale consists of 14 items where participants respond on a 5-point scale, where 1 = strongly disagree and 5 = strongly agree. Sample items include, "I think of the natural world as a community to which I belong," and "I often feel a kinship with animals and plants" (Mayer & Frantz, 2004). Perrin and Benassi (2009) argue that their studies indicate the CNS to rather be a measurement of beliefs rather than affect. However, in a study by Tam (2013), dispositional empathy was found to be highly correlated with the CNS suggesting that it has the ability to explore the emotive component of the relationship that people have with nature. Studies report the CNS to be a valid and reliable scale (Mayer & Frantz, 2004). An overall Cronbach alpha = .84 and test-retest reliability of r = .79 is reported (Mayer & Frantz, 2004). In this study the Cronbach alpha was .83.

3.3.1.1.7 Behavioural Measure

A Behavioural Questionnaire (BQ) was self-developed to determine current behaviours that negatively impact the environment such as waste, transport, energy, purchases and consumption, water, and general behaviours. Existing behavioural questionnaires and attributes identified by Defra (2008), OECD (2011) and Zarepour (2012) were used as a framework and then elaborated as well as simplified where necessary for use in South Africa. The rationale for including this questionnaire was that it is valuable for measuring actual (or at least, self-reported) behaviour of participants because attitudes and values do not necessarily translate into behavioural expression (Beattie, 2013). Furthermore, research conducted by Beattie (2013) suggested that people could have an implicit or explicit attitude that is positive towards the environment but that does not necessarily mean that their behaviour mirrors this, which is an important factor to consider when describing typologies and building theory.

The BQ asked participants to what extent they participated in a range of behaviours on a scale of 1 = never do it, 2 = rarely do it, 3 = sometimes do it, 4 = often do it, 5 = always do it. Sample items from the Waste section included, “recycle glass bottles/containers”; Transport section included “find ways to reduce fuel consumption”; Energy section included “switch off lights when not needed”; Purchase and Consumption section included “purchase products that generate the least amount of waste”; Water section included “bath less, shower more”; and the General section included “I grow my own vegetables and fruits”. After data were gathered the BQ was subjected to a Factor Analysis data reduction process to extract meaningful themes. This is described in this Chapter, Section 3.3.1.3.5.2.

3.3.1.2 Data collection

The collection step in the systems design model describes the data collection method in the quantitative phase of the study. At first the data collection tool is discussed, followed by how participants were invited, the piloting of the questionnaire is explained, and lastly the associated ethical considerations are evaluated.

3.3.1.2.1 Data collection tool for the survey

An engaging desktop online quantitative survey tool (https://www.visioncritical.com) was used to deploy the questionnaire battery after being programmed by a qualified survey tool programmer. A company called Nudge Now (Pty) Ltd. sponsored the use of the software programme. The software makes use of drag-and-drop functionality, selection cards, rank order sorting, sliding scales, choice buttons, and drop-down menus in order to make the questionnaire more engaging. The benefits of using an online survey tool are that the sample can be accessed easily through social media and e-mail integration, it is cost effective, easy to use, longer surveys are possible as participant fatigue is minimised, participants can complete it at home, participants can complete the survey in multiple sittings, participants can ‘opt-out’ at any time, and survey results are available real-time.

The Jung Type Indictor (JTI), had its own online completion software (using Flash) which had to be linked to the study software programme. For the JTI, results were not available immediately and manual participant follow-ups had to be done. Participants who dropped off the main survey (before getting to

the JTI) were sent an automatic reminder and a link to their survey by the system in order to complete the survey in another sitting. Some participants dropped off during the linking process to the JTI, potentially due to slow internet connectivity that made them believe they were done with the survey or some participants did not have Flash on their computer and received an error message. For these participants the researcher had to manually extract their JTI links and e-mail it to them for completion. For participants who had issues to complete the JTI because they did not have Flash, the researcher offered to assist with the completion of the short questionnaire telephonically. Although the above was used as a measure to capture participants that dropped off, not all participants completed the JTI. Statistically this was not a concern as personality was used for profiling rather than for clustering.

Using an online survey tool has some shortcomings, namely that people who do not have internet access were not included in the study as well as people who might not be able to read or use technology. These shortcomings did not pose a significant problem to the study as the sample was focused on literate middle to upper income South Africans who are likely to carry the highest burden of carbon footprint in the country. Conducting a study with similar objectives with lower income South Africans could be a direction for further research. There are also some benefits and shortcomings associated with self-report measures that need to be considered in the context of this study.

Self-report measures have various benefits such as they are practical and effective, convenient and easy to administer, affordable, provide direct insight into unique personal information, there is individual inspiration to respond, one can control most response biases, and there are readily available psychometrically-tested inventories (McDonald, 2008). Hine (2011) suggests that self-report measures are ideal for exploring issues relating to the environment since participants feel less burdened. Some drawbacks of self-report measures mentioned by McDonald (2008) are socially desirable responding, agreeable responding, extreme responding, the assumption that participants are self-knowledgeable and do not have distorted self-perceptions, issues with non-context-specific language use of questions, and possibly some cultural limitations especially in studies with moral overtones. These limitations were addressed by allowing participants to remain anonymous, also by confirming that there were no right or wrong answers, ensuring that the measures employed were culturally fair and excluding any repetitive responses in the data. Additionally, participants were screened for English proficiency through a question in the questionnaire that excluded individuals who indicated that they do not understand English, or that they struggle or are only fairly compentent in the language.

The next section explores the means by which participants were recruited for the study.

3.3.1.2.2 Participant sourcing for the survey

In order to obtain the sample, three recruitment approaches were used namely: database recruitment, social media (Facebook), and snowballing. The database was purchased from professional recruiters and had around 3000 e-mails of individuals who willingly opted into participating in research studies. The database recruitment method, a push strategy, was not able to recruit a large number of people for

various reasons such as: e-mails being seen as spam or it being a poor quality database. Social media targeting, as a pull strategy, was used to invite people to participate on social media.

Using social media as a recruitment tool is gaining popularity, especially in medical research, and is often the most successful recruitment strategy (Topolovec-Vranic & Natarajan, 2016). Social media have a wide reach, with Facebook being the fourth most visited site in South Africa according to Alexa.com (American web traffic analysis organisation), with 21 million users (Pienaar, 2018). People could either scroll past the invitation (without being identified by the researcher) on their newsfeed or choose to click on the banner that directed them to the participant information sheet. Only once they were happy with the information provided (transparency) could they choose to proceed to the questionnaire. A risk of Facebook recruitment is cross-participant communication where they share information about the questionnaire with each other (Gelinas et al., 2017). This possible risk was managed by switching off the comment function on the Facebook invitation. With regards to snowballing, 21 participants shared the survey with others.

After agreeing to participate, participants were directed to screening questions. Participants had to identify as being South African as it was a South African study, they had to at least be competent in English as the questionnaire and interviews were in English and they had to be at least 18 years old due to the limits of the ethical protocol. Participants were not excluded from the study based on their income, as there might be students or unemployed people who live in a middle or upper income household. Also, the system automatically detected whether a person was accessing the survey on a mobile device and then indicated that the survey was programmed for desktop use only. This screening process was chosen to increase reliability of data captured as well as participant ease and enjoyment in completing a lengthy survey, as the interactive functionality of the survey is best used on a desktop.

A lucky draw was used to provide participants with compensation for their time and data used to participate. The prizes were a R5000 smartphone voucher and Faithful to Nature online vouchers to the value of R3000, R2000, R300, and R200.

3.3.1.2.3 Survey pilot

After putting the survey battery together, pilot testing was done in three stages. Firstly, a statistician reviewed the questionnaire and relevant feedback was integrated before the survey was programmed into the software and sent out to participants. Secondly, a small sample (N = 8) of participants was recruited to complete the survey and then provided feedback, and lastly, the researcher conducted back-end data checking for technical or routing issues. The data gathered from the pilot-testing phase were not included in the final analysis.

The sample for the pilot test was selected randomly from the study database that was used for the full-scale study. In order to receive 5-10 completed surveys, 100 invitations were sent out. A final sample of 8 was reached for the pilot study. Participants received the online survey link worded and constructed identically to the full-scale study link. The survey was live for one week. Out of the 8 participants who

completed the pilot study one dropped off before completing the JTI. This was a good indication that the researcher could expect some drop-off during the actual fieldwork due to technical issues or that the linking took too long and participants thought that they had completed the entire survey. Additionally, one issue that emerged was that the JTI software used Flash, which not all participants had installed, preparing the researcher for any issues that could be experienced during the full-scale launch.

The average time it took participants to complete the main survey was 49 minutes with an additional 15 minutes for the JTI (Jung Type Indictor Manual, Psytech). Participants received an e-mail 24 hours after they completed the survey and asked if they would be willing to provide feedback regarding their experience for an additional entry into the lucky draw. Four participants provided post pilot feedback. Questions asked in the pilot feedback email are included in appendix 14.

Feedback influenced revisions of the survey prior to launching the full study. The researcher simplified attributes or added an explanation for some items (e.g. fair trade, global warming, and climate change needed explanations). Some attributes were seen as repetitive and were clarified or removed from the survey.

3.3.1.2.4 Fieldwork ethics

Ethical clearance (appendix 1) was requested and granted unconditionally by the university human research ethics committee (non-medical) prior to commencing with fieldwork for the study. Before participants were directed to the survey they were provided with the participant information sheet that contained information regarding the study for participants to consider (appendix 2).

Only once participants indicated with a tick box that they were willing to participate did the online link take them to the full survey. Opting into the lucky draw took participants to a separate website. Participants could choose to remain anonymous but then would not be able to participate in the lucky draw. Additionally, participants could opt-out at any time by way of an opt-out button available in the survey and in the reminder e-mails. The system would then automatically stop sending participants any communication.

After completion of the quantitative survey, participants were asked whether they would be willing to volunteer for the qualitative phase of the research of which the detail was contained in the participant information sheet initially provided. Those willing to volunteer were flagged in the dataset for the qualitative phase. Personal identifying information provided for all other participants was then deleted after the lucky draw had taken place.

The lucky draw was done after completion of the quantitative fieldwork using a randomization algorithm. A letter (appendix 3) was sent out to all participants who provided contact details, thanking them for their participation, information about the second phase and the initials and city of the lucky draw winners. The researcher contacted all winners personally and confirmed receipt of their prizes via e-mail. In a

separate e-mail an infographic of summarized feedback of the overall results (appendix 4) was provided to all participants.

3.3.1.3 Data analysis

An objective of the study was to identify and describe typologies. This section aims to elaborate on how this was done using descriptive analysis of the data, scoring, Factor Analysis of the EIAQ and BQ, cluster analysis and profiling, and discriminant analysis. Data analysis was carried out using STATISTICA version 12 (StatSoft, 2013) using the 5% significance level, that is to say p-values <0.05 were used to indicate significant results.

3.3.1.3.1 Descriptive analysis

The data were described by frequencies and percentages for the categorical variables and means, standard deviations, medians, and interquartile range for continuous variables. The descriptive information about the sample is reported in section 4.11 and appendix 16.

3.3.1.3.2 Sample demographics

A total sample of 753 was achieved with 642 participants who completed the full survey and 111 who dropped out when they were directed to the JTI. The total sample consisted of 39.6% males and 60.4% females. The racial splits in the sample were 40.9% white, 38.2% black, 11.2% mixed, 6% indian, 2.3% refuse, and 1.5% other. The majority of the sample was based in Gauteng 51.8% with 21.5% in the Western Cape, 14.2% KwaZulu Natal, 6.1% in Eastern Cape, and 6.4% in Other. The age spread of the sample consisted of 27.0% in the 18-25 year old category, 29.9% in the 26-35 year old category, 19.9% in the 36-45 year old category, 18.9% in the 46-55 year old category, 3.5% in the 56-65 year old category, and 0.9% in the 66+ year old category. With regards to home language 46.6% of participants indicated English as their home language, 17.8% Afrikaans, 10.6% Zulu, 7.0% Xhosa with the remainder making up smaller portions of the total sample (Northern Sotho – 4.8%, Tswana – 3.3%, Sotho – 2.7%, Tsonga – 2.3%, Venda – 1.7%, Swazi – 1.1%, Ndebele – 0.5%, Other – 1.6%). Although not all participants spoke English as their home language 78.9% said they were fluent in English and the remainder (21.1%) said that they were competent in English.

The majority of the sample was Christian (72.6%). The second most common was no religion at 16.2%. Islam (3.7%), Hinduism (2.1%), Judaism (1.1%), Buddhism (0.3%), and other (4.0%) made up the remainder of the sample. Of those who indicated a religion, 33.9% indicated that they were very religious, 40.4% somewhat religious, 7.7% slightly religious, and 1.9% not at all religious. Furthermore, while growing up, 63.0% of the sample had both parents living at home for at least two years and 23.0% had one parent. 6.0% of the sample had no parents while growing up and 7.0% had more than 5 “parents” in the house (perhaps multiple families where aunt or grandmother is seen as a second mother or step-parents where there were divorces). In terms of siblings, 9.0% of the sample were only children, 25.0% had one sibling, 26.0% had two siblings, 16.0% had three siblings, 8.0% had four siblings, 5.0% had five siblings, and 11.0% had more than five siblings. Finally, the study sample was relatively educated, with 76.1% having some form of post-school qualification.

3.3.1.3.3 Scoring of CNS, NEP and SVS

The scoring for the CNS, NEP and SVS was done according to the authors' instructions. Data were examined descriptively with reverse-score items as indicated. Eleven participants provided identical responses across items for the CNS and eight participants for the NEP and were excluded from the scoring and evaluation of the CNS and NEP.

For the SVS there were no issues related to missing data, since non-response was not permitted in the SVS. Eighty participants used a single response level 35 times or more and were therefore excluded from the scoring and evaluation of the SVS.

3.3.1.3.4 Scoring of the EIAQ rankings section

The first question of the EIAQ was a ranking of important issues. For the most important ranking section a top ranking was awarded 3 points, second in the ranking was given 2 points and third place 1 point. The points for each issue were then calculated. The item with the most summed points was allocated a relative score of 1.00 and the other issues were ranked relative to this using their summed points. The least important ranking was done using a similar process with the top ranking receiving 2 points and the second 1 point. Factor Analysis was conducted on the remainder of the EIAQ.

3.3.1.3.5 Factor Analysis of the EIAQ and BQ

The EIAQ and BQ were each subjected to Factor Analysis using Varimax (orthogonal) rotation to identify underlying dimensions in the data. This data reduction process reduced the dimensionality of the data for subsequent use in the cluster analysis. The eigenvalue criterion, scree plot, and proportion of the total variance explained criteria were used to establish the number of factors derived. The final subscales were scored by averaging the scores of the items making up the subscales. Internal consistency was assessed by Cronbach's alpha.

Participants who selected the same responses across all items were excluded from the Factor Analysis. These exclusions are described below for each section of the EIAQ and BQ. For a respondent who indicated "no opinion", this data could not be used in the Factor Analysis as it would register as missing data. Therefore, the assumption was made that if somebody indicated 'no opinion', they were not concerned about the issue and these responses were re-coded as 'not at all concerned' to allow for Factor Analysis to take place. The following section reports the detail of the Factor Analysis for the EIAQ and BQ.

3.3.1.3.5.1 EIAQ Factor Analysis

This section describes the Factor Analysis for the environmental concerns, animal concerns, and attitudes section of the EIAQ.

3.3.1.3.5.1.1 Environmental concerns

There were 19 participants who selected the same response across all 20 items and were excluded from the Factor Analysis. A sample of > 100 is required, and for this analysis the sample was 734. Five to 10 observations are required per item with this section containing 20 variables, which translates to 734/20 = 36 observations per item. Factor Analysis requires at least 5 items per proposed factor therefore ~20/5 = 4 factors could be afforded. Furthermore, in order to conduct a Factor Analysis a large number of correlations > 0.30 are required which the matrix of correlation coefficients confirmed (Hair, Black, Babin, & Anderson, 2010). The initial Factor Analysis on all 20 items suggested 5 factors (eigenvalue criterion) or 6 factors (scree plot, % variance explained). After examining both the 5-factor and 6-factor solution the 5-factor solution was re-run excluding noise pollution as it was standing on its own. This suggested 4 factors (eigenvalue criterion) or 5 factors (screen plot, % variance explained). After examining the 4- and 5-factor solutions the Factor Analysis was re-run without ocean acidification since it did not fit well in Factor 1 of the 4-factor solution.

The 4 factor solution was coherent with at least 3 items per factor and each item had a loading of > 0.50. The 4 factor solution consisted of the following: human-centric (items that relate to humans; Cronbach alpha = 0.795), climate-centric (items that can be associated with natural concerns, more long term and abstract; Cronbach alpha = 0.824), resource-centric (items that directly impact human survival, can be experienced in the short term; Cronbach alpha = 0.752) and science-centric (items that relate to the scientific sphere and institutional control; Cronbach alpha = 0.668). The items on noise pollution and ocean acidification were removed.

3.3.1.3.5.1.2 Animal concerns

There were 65 participants who selected the same response across all 17 items and were excluded from the Factor Analysis. A sample of 688 was available for analysis. Five to 10 observations are required per item with this section containing 17 items, which translates to 688/17 = 40 observations per item. Factor Analysis requires at least 5 items per proposed factor therefore ~17/5 = 3 factors could be afforded.

The Factor Analysis on the 17 items suggested 2 factors (eigenvalue criterion, scree plot) or 3 factors (% variance explained). The 2 factor solution was coherent with at least 3 items per factor and each item had a loading of > 0.50. The 2-factor solution consisted of the following: animal exploitation (where animals are exploited for the benefit of humankind; Cronbach alpha = 0.894) and animal extinction (animals are being killed for the benefit of humankind; Cronbach alpha = 0.886).

3.3.1.3.5.1.3 Attitudes

Three participants selected the same response across all 30 items and were excluded from the Factor Analysis. All ‘don’t know’ responses were recoded as ‘neither agree/disagree’. A sample of 750 was available for analysis. Five to 10 observations are required per item with this section containing 30 variables, which translates to 750/30 = 25 observations per variable. Factor Analysis requires at least 5 items per proposed factor therefore ~30/5 = 6 factors could be afforded.

The Factor Analysis suggested 6 factors (scree plot) or 7 factors (eigenvalue criterion, % variance explained) but four items ('we must sacrifice economic growth in order to preserve and protect the environment', 'we must be prepared to sacrifice environmental quality for economic growth', 'domestic animals are a key source of economic growth and job creation', and 'farm animals are a key source of economic growth and job creation') had no loadings > 0.50 and were therefore excluded and the Factor Analysis was re-run. The re-run suggested 5 or 6 factors (eigenvalue criterion, % variance explained; scree plot was not helpful). The 5 factor solution was comprehensive with at least 3 items per factor and each item has a loading of > 0.50. Although the 6-factor solution was also a viable option, the solution with fewer factors was taken forward in order to reduce the number of variables for the study. The 5-factor solution consisted of the following: shifting responsibility (allocate responsibility externally; Cronbach alpha = 0.904), role of individual (change starts with individuals; Cronbach alpha = 0.707), role of government (change dependent on government; Cronbach alpha = 0.809), role of technology (change depends on technological progress; Cronbach alpha = 0.826), and apathetic attitudes (none-caring items; 0.747).

3.3.1.3.5.2 BQ Factor Analysis

Six participants selected the same response across all 58 items and were excluded from the Factor Analysis. All 'Don't Know' or 'Not Applicable' (DK/NA) responses were recoded as the mean of the participants' non-DK/NA items. Five to ten observations are required per item with this section containing 58 items that translates to 747/58 = 12 observations per variable. Factor Analysis requires at least 5 variables per proposed factor therefore ~58/5 = 11 factors could be afforded.

Factor Analysis was re-run on multiple occasions because factor solutions often produced items with no factor loadings >0.50 and factors with only one or two items. In each of the 12-factor, 11-factor, and 10-factor solutions the items with no loadings were removed and the Factor Analysis was re-run. Items removed were recycle food waste, pick up litter, use own bag for shopping, car pool/share, offset carbon emissions, reduce swimming pool pump usage, make use of solar power, cut down on heating/air conditioning, wait for full load before using dishwasher, eat animal derived foods, reduce general water use, plug the sink when washing dishes, water garden in the coolest part of day, use water efficient toilets, use water efficient appliances, and encourage wildlife in garden. The final Factor Analysis on 41 items suggested 9 factors (eigenvalue criterion) with all items producing factor loadings 0.50 and loading onto only one factor. All factors had at least three items. The 9 factor solution consisted of the following factors: recycle (Cronbach alpha = 0.885), energy reduction (Cronbach alpha = 0.776), conscious consumption (Cronbach alpha = 0.853), environmentally friendly travel (Cronbach alpha = 0.681), charitable behaviour (Cronbach alpha = 0.866), environmentally conscious travel (Cronbach alpha = 0.723), individual water reduction (Cronbach alpha = 0.613), re-use (Cronbach alpha = 0.759), and smart gardening (Cronbach alpha = 0.666).

3.3.1.3.6 Selection process for clustering variables

After the Factor Analysis was completed, variables for the cluster analysis were selected based on sample size and correlation with each other, as determined by Spearman's rank correlation. The

variables selected for cluster analysis also needed to represent the key areas of the study (i.e. connectedness to nature) the researcher was interested in identifying in the typologies (Mandara, 2003). The minimum theoretical sample size for a cluster analysis is $n = 5*2^k$ where k is the number of clustering variables. Given the sample size of 753, ~ 7 clustering variables could be afforded.

The JTI, SVS, NEP CNS, BQ (8 factors), EIAQ Environmental concerns (4 factors), EIAQ Animal concerns (2 factors), and EIAQ Attitudes (5 factors) were considered for cluster analysis. Using the SVS, JTI and EIAQ Animal concerns would have risked the loss of a portion of the overall sample (due to response routing, as well as exclusions after cleaning the data) and were therefore excluded from cluster analysis consideration. Furthermore, when the SVS was considered for clustering the subscales were at least moderately correlated with one another and therefore not suitable for clustering. For these reasons the SVS and EIAQ were rather used for profiling, together with the JTI and BQ. Biographical information was not considered for clustering because it is an unreliable way of clustering individuals, as discussed in the literature review. Spearman's rank correlation coefficient was used to establish which of the remaining variables were highly correlated.
The Spearman's correlation results showed that:

- The NEP and CNS were moderately correlated (r>0.3)
- The EIAQ Environmental concerns subscales were mostly strongly correlated (r>0.5) and thus some subscales would need to be removed for clustering
- EIAQ Attitudes on role of technology and apathetic attitudes were moderately correlated (r>0.3)
- NEP and CNS were moderately correlated with the EIAQ Environmental concerns, human-centric (r>0.4), and moderately negatively correlated with the EIAQ Attitudes shifting responsibility (r>0.5 and r>0.3) and apathetic attitudes (r>0.4)

For those variables that were moderately or highly correlated, one variable was considered for the cluster analysis and the other variable for cluster profiling since only seven clustering variables were required. These variables were explored in different combinations. Variables chosen for the final cluster solution were based on stability, clarity, and uniqueness. Additionally, variables had to be cumulatively coherent to depict 'nuanced' clusters. The final variables used for clustering were the CNS, EIAQ shifting responsibility, EIAQ role of individual, EIAQ apathetic attitudes, EIAQ resource-centric, and EIAQ science-centric. These variables were all on similar scales (1-5 scale), except for the CNS (1-7 scale). The difference did not warrant standardisation; thus the variables were used in the cluster analysis without standardisation. K-means cluster analysis employed the selected variables using the options for 4, 5, or 6 clusters. Cluster stability was determined by cross-tabulating the results for the same cluster using different starting points. Observations selected were based on their ability to maximise initial between-cluster distances, and observations were taken at constant intervals from a list of sorted distances. Cluster solutions where less than 5% of cases were misclassified were reserved for consideration.

3.3.1.3.7 Cluster Analysis

After Factor Analysis was completed a K-means cluster analysis was conducted on selected variables using the options for 4, 5, or 6 clusters. Out of the total sample of 753 participants, 721 could be used during the clustering process (the rest had one or more variables with missing data). Clustering was used to group participants into a few groups so that participants within any group were more similar compared to participants from different clusters. Clustering variables were used to generate the clusters, while profiling variables were the remaining study variables used to describe the clusters that were identified. The stability of the clusters was evaluated by cross-tabulating the results for the same cluster analysis but using two different starting points (i.e. observations chosen to maximize initial between-cluster distances, and observations taken at constant intervals from a list of sorted distances). Cluster solutions for which fewer than 5% of cases were misclassified were retained for consideration.

3.3.1.3.8 Profiling of clusters

The association between clusters and the other study variables was determined as follows: The X^2 test was used to assess the relationships between clusters and categorical variables. Fisher's exact test was used where the requirements for the X^2 test could not be met. Effect size was determined by Cramer's V. A strong association is indicated as 0.50 and above, moderate association is 0.30 to 0.49, weak association is 0.10 to 0.29 and little, if any associated is below 0.10 (Cohen, 1988).

The relationship between clusters and continuous variables was assessed by one-way Analysis of Variance (ANOVA). Post-hoc tests were conducted using the Tukey-Kramer test for unequal group sizes. Where the data did not meet the assumptions of one-way ANOVA, a non-parametric alternative, the Kruskal-Wallis test was used instead. In this case, post-hoc tests were conducted by pairwise comparisons with the p-value adjusted for multiple comparisons. Effect size was determined by eta-squared where a small effect was considered 0.01, a medium effect 0.06 and a large effect 0.14 (Cohen, 1988).

Overall, the false discovery rate was controlled by the Benjamini-Hochberg procedure.

3.3.1.3.9 Discriminant Analysis

Discriminant Analysis was conducted to be able to cluster participants into a typology using as few questions as possible in the future.

The sample considerations for discriminant analysis were as follows:

- Ratio of observations to predictors should be at least between 5-20: for the study there was 721/7 = 103
- The size of each group should be greater than the number of predictors (7), preferably >20: the smallest group size was 75

- Group sizes should roughly be equal: the group sizes were not that disparate. Later comparison of accuracy and coefficients for equal prior probabilities and prior probabilities based on group sizes showed that there was not much difference.

The results of the discriminant analysis were a very much shortened questionnaire (with an algorithm) that can be used to identify typologies in the future rather than using the long questionnaire used for this study. The shortened questionnaire (appendix 5) includes connectedness to nature (CNS), shifting responsibility, role of the individual, apathetic attitudes, human-centric concerns, resource-centric concerns, and science-centric concerns. The accuracy of this analysis was 90.4%; that compares well to Poortinga and Darnton (2016) who developed a 15-item questionnaire to identify their typologies that yielded an accuracy of 72%.

3.3.2 Qualitative phase

The qualitative phase consists of linking, exploration, analysis and validation phases.

3.3.2.1 Linking

3.3.2.1.1 Interview recruitment

Each participant who indicated that they were willing to participate in the qualitative research was allocated to an identified typology based on the cluster algorithm and filtered on whether they were based in Cape Town, Durban, or Johannesburg/Pretoria. These major cities were chosen for the qualitative research as they hold the majority of participants; they were logistically accessible; and represented the main carbon consumers of South Africa. The researcher approached the recruitment on a city-to-city basis, starting with Cape Town, then Durban, and lastly Johannesburg/Pretoria. Johannesburg/Pretoria fieldwork was done last as most of the sample was situated there and therefore the researcher felt it would be easier to top up typologies that perhaps lacked participants from the other two cities.

A mixture of purposive and maximal variation sampling was used. Purposive sampling was used where the participants were selected to participate based on their willingness, availability, and their representation of a typology (Teddlie & Yu, 2007). Within this sampling regime the researcher applied the principle of maximal variation sampling within each typology, aiming to sample a range of different people within each typology. This was heavily influenced by the number of people available and willing to participate.

Participants who did not respond to the e-mail within the timeframe were assumed to no longer be willing to volunteer for the second phase of the research and were removed from the database of participants for the qualitative phase. Once the interview dates, times, and venue were confirmed the researcher e-mailed confirmations individually to each participant with the interview details. A reminder text message and/or e-mail were sent out closer to the scheduled date of the interview.

3.3.2.1.2 Interview guide

The interview guide (appendix 6) was developed with the aim of exploring each typology for Grounded Theory Analysis. The semi-structured interview guide was developed to last between one to one and a half hours. The interview guide was designed with four areas of exploration namely; understanding participant's lives, exploring self-perceptions, perceived relationships with the biosphere, and how they viewed climate change. After each cycle of interviews the researcher added points to listen out for in the following typology interviews based on the research journaling and initial informal codes for each typology.

The relationship that people have with the biosphere is an abstract concept and it was anticipated that it might be difficult for participants to describe their relationship with something abstract (not human) and therefore an enabling technique to be used during the interviews as part of the interview guide was developed.

3.3.2.1.3 Enabling technique

An enabling technique is a psychologically constructed visual technique that has the ability to use a visual representation in order to unearth the depth of a specific concept contained inside the psyche. Some other benefits are that it allows for the expression of values, provides access to sensitive topics, has the ability to explore hidden attitudes and feelings (Donoghue, 2000), allows for multiple interpretations (Basu, 2014), provides an organising framework for data analysis, encourages participants to express their experiences, allows for emotional engagement (Comi, Bischof, & Epplier, 2014), has the ability to activate memory recall (Wheeldon & Faubert, 2009), has been found to reduce social desirability, increases cognitive access (overcome bounded rationality) (Bond & Ramsey, 2010), and is less intrusive for participants in that they are under less pressure compared to direct questioning (Will, Eadie, & MacAskill, 1996).

Although there are many benefits to using enabling techniques there is one important shortcoming. In a critique by Lilienfeld, Wood and Garb (2000) they are said to have questionable psychometric properties. To address this issue Comi et al. (2014) maintain that the data collected from enabling techniques are complex and should be integrated with information gained from the interview in order to ensure accurate interpretations. Given that the enabling technique was used to elicit deeper responses about the typology-nature nexus this would be interpreted in the context of the broader interview.

There is a lack of information on how to develop an enabling technique, especially one that explores people's relationship to the biosphere. A technique was developed using a deductive approach (table 6 shows the approach) that created categories of types of relationship to nature using themes that emerged from existing literature (appendix 7 and Section 2.2.2 & 2.5.3 in the literature review). While using content analysis to construct theoretical categories emergent from existing theory, primary data was collected using an online research tool and recruitment through social media. Survey Gizmo (https://www.surveygizmo.com) was used to collect both textual and visual data. As compensation for time and effort, participants who completed the questionnaire were entered into the lucky draw, which

formed part of the larger study. Participants were asked to complete demographic questions and then first upload a picture that describes the way they think, what they believe, how they see and feel about nature. The idea was to first get a spontaneous visually representative idea of their relationship to nature. After uploading the picture participants were asked to describe in words their thoughts, beliefs, visuals and feelings that they associate with nature in the picture they chose to upload.

In total 43 data sets were gathered of which 34 completed both textual and visual responses, 8 provided only textual responses and 1 a visual response (excluded from analysis). 25 participants were female and 18 were male. With regards to racial spread 60% of participants were white, 26% were black, 9% were mixed, 2% were indian and 2% refused. Most participants were from Johannesburg, Cape Town and Pretoria and surrounding areas with the majority of participants (81.4%) being Christian.

The results from the online study were used to both validate and expand the identified categories through a process of coding and categorising. The final cards were influenced by the cutout pictures shared by participants during the research. See appendix 7 for more detail on pictures shared by participants. Based on the confirmed set of categories aligned with participant's visual and textual data, sets of pictures were developed using these categorical classifications. A set of pictures was developed (rather than using existing ones) in order to ensure no copyright infringement, that they each had the same general feeling, colour types etc., to avoid participants choosing a picture that might be clearer or printed brighter, and they had to be relevant to South Africans. In this way, each enabling picture had the same chance of being chosen by a participant. Following the development of the pictures another online study with professionals (N=5) in South Africa, Italy, and Uruguay (psychologists working in environmental and ecopsychology) was launched in order to test the ability of each picture to be descriptive, usable, understandable, and enabling. Based on these results, pictures were confirmed, amended, or deleted from the set. The final set of pictures formed part of the qualitative phase of the larger study. The categories of connection to nature identified for the purposes of the fieldwork were not absolute.

Table 6: Summary of deductive approach to develop an enabling technique

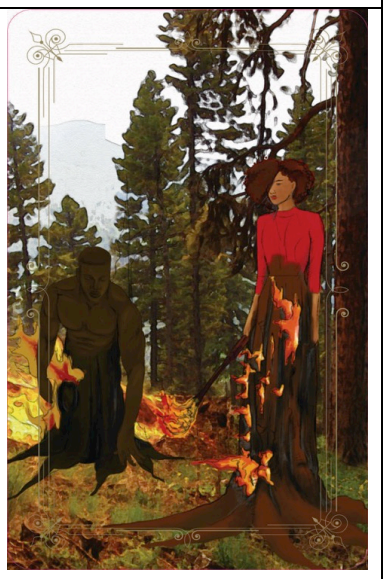
Step 1	Create tentative categories using existing literature
Step 2	Using thematic analysis principles, create codes for each identified category (appendix 7 and Section 2.2.2 & 2.5.3 in the literature review)
Step 3	Gather initial data from participants exploring potential category expressions (N = 43). This sample was separate to the people who participated in the main study.
Step 4	Match data gathered with tentative theoretical category codes. Confirm, reduce, or expand categories
Step 5	Develop a set of pictures with same expression, style, and colour scheme
Step 6	Test feasibility of picture set to measure identified categories with experts. Also evaluate the ability of each picture to be descriptive, usable, understandable and enabling (N = 5)
Step 7	Confirm, amend, or delete pictures from the set

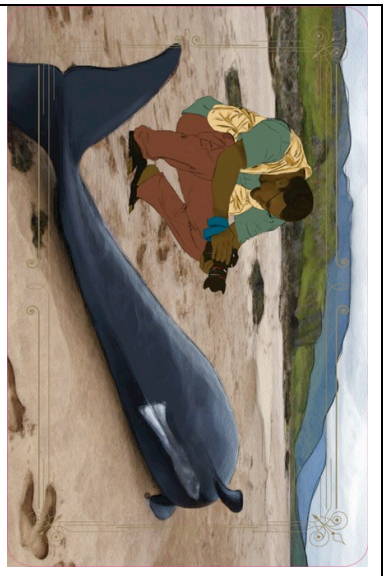
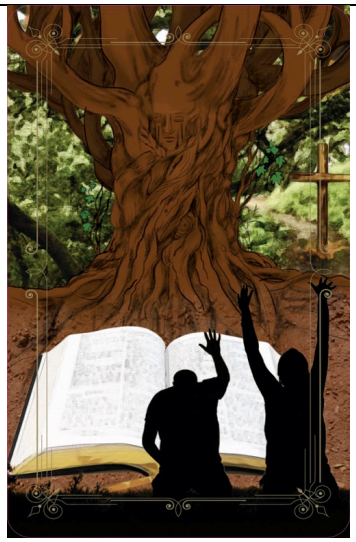
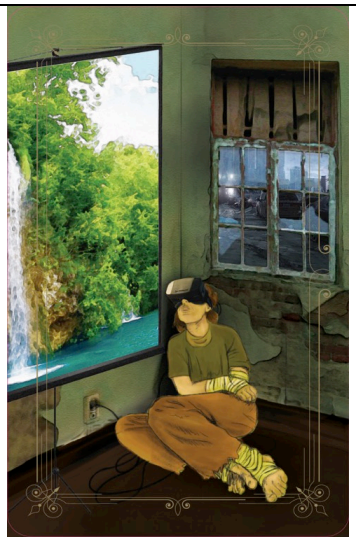
Step 8	Finalise picture set to be used in main study

During the interviewing fieldwork, participants were asked to choose a picture/s that they felt represented their relationship with nature as well what they felt would demonstrate their opposite relationship with nature. Participants were asked to explore their definition of nature, their role in it and how they felt during this process. Once they chose their cards these relationships were explored together. Although each card was related to a category (which was used to develop the set initially) these categories were not used during the analysis but rather what participants said and the context of their relationships was explored. Therefore, a card that was developed to represent intimacy might represent alienation for a participant. Participants were allowed to choose more than one card to represent their relationship with the biosphere.

Table 7 shows the categories used to develop the cards and the final cards. Table 8 reports the cards chosen by participants during the interviews.

Table 7: Final set of NNET cards used in the fieldwork

EXPRESSION	**LIGHT** Typically associated with positive expressions	**SHADOW** Typically associated with negative expressions
INTIMACY		

EMPATHY		
THEOLOGICAL ENGAGEMENT		
RECREATIONAL ENGAGEMENT		

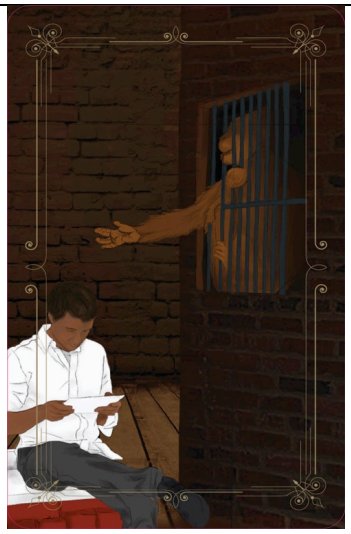
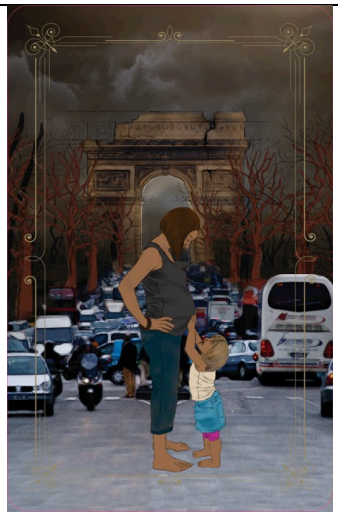
AMBIVALENCE		
APATHY		
ALIENATION		

Table 8: Cards chosen during qualitative fieldwork

Card chosen	To represent relationship with biosphere	To represent opposite relationship with biosphere
INTIMACY - LIGHT	8	1
EMPATHY - LIGHT	3	1

THEOLOGICAL ENGAGEMENT - LIGHT	7	3
RECREATIONAL ENGAGEMENT - LIGHT	2	4
AMBIVALENCE - LIGHT	8	4
APATHY - LIGHT	1	4
ALIENATION - LIGHT	4	4
INTIMACY - SHADOW	2	4
EMPATHY - SHADOW	1	1
THEOLOGICAL ENGAGEMENT - SHADOW	5	0
RECREATIONAL ENGAGEMENT – SHADOW	5	4
AMBIVALENCE – SHADOW	1	7
APATHY – SHADOW	2	6
ALIENATION - SHADOW	5	11
TOTAL	**54**	**54**

3.3.2.1.4 Pilot interviews

Two pilot interviews were conducted prior to commencing the interview fieldwork. The overall purpose of the pilot interviews was to establish approximately how long interviews would take, participant comprehension of questions, ease of responding, and efficacy of the enabling technique in a face-to-face interview. The pilot interviews took between 1-1.5 hours to complete. The data from the people who participated in the qualitative pilot interviews were not used for the main study.

Some general pilot interview feedback was as follows:

- Participants spontaneously spoke about nature as representing plants, water, mountains, etc. Animals did not spontaneously emerge as an association with nature. The researcher made a note to probe views regarding animals. The researcher opted not to define nature to the participants so as not to lead them and to rather get an understanding of their spontaneous view first.
- The interview yielded an idea of the current relationship to nature but not necessarily their past experiences. The researcher made a note to probe past experiences.
- Participants should be allowed to choose more than one card to help make sense of their relationship with the biosphere; hence Table 8 shows 54 cards were chosen when only 44 participants were interviewed.
- One participant selected an opposite card to describe the opposite of his relationship with nature. This question was added to the interview guide, as it provided a good understanding of the relationship that the participant had with nature by looking at the perceived opposite. See Table 8 for opposite card selections.
- Questions that participants struggled to understand were re-worded in the interview guide.
- Climate change questions saw participants feeling out of depth and uncomfortable, but the researcher made a note to re-word the probing questions for ease of understanding.

The guide was not treated as final with the assumption that as fieldwork progressed some questions might be added or re-worded keeping the core of the interview guide constant. As specific insights

emerged for a typology during the fieldwork, they were treated as sensitisation topics to listen out for in the following in-depth interviews for that typology.

3.3.2.2 Exploration

The in-depth interviews, fieldwork journal, cluster mapping and transcript discussion forms part of the exploration phase in the systems model for mixed methods design.

3.3.2.2.1 In-depth interviews

In-depth interviews were conducted with participants who volunteered during the quantitative phase in Cape Town, Durban, and Johannesburg/Pretoria. The interviews were on average an hour in length and conducted at a time and place convenient and safe for both participant and researcher. The interview venues ranged from the participant's home, office (where they had a meeting room or office available), or a central venue. The central venue in Cape Town was the Central Library (private meeting room), in Durban it was a Bed and Breakfast that had a meeting room available or a coffee shop (two participants), and in Johannesburg/Pretoria it was the Sandton City Library (private meeting room) or a coffee shop (one participant). Although a coffee shop is not the best place to conduct an interview, the researcher realised that some participants felt more comfortable meeting a stranger in a public open space. The background sound did not pose a problem as the audio recording equipment phased out background noise.

The research process and role of the interview was described to participants. They were asked to sign two consent forms (appendix 8). The first form requested consent to participate in the interview voluntarily, indicating that their responses were confidential, they had a right to withdraw at any time, they were not obliged to answer any question they do not want to, that they could request to view the transcript, that they consented to be interviewed, and that direct quotes could be used anonymously. The second consent form was for the interview audio recording and consent to use direct quotes. All participants provided consent on both forms. Participants were provided with a R200 gratuity for their time and any costs they had to incur to drive/take public transport to the interview or correspond with the researcher (i.e. calls).

In total 44 interviews were completed with 14 in Cape Town (2 people did not arrive out of 16 who volunteered), 10 in Durban (2 people did not arrive out of 12 people who volunteered), and 20 in Johannesburg/Pretoria (all arrived). The cities were treated as the cycles of interviews for Grounded Theory, with Cape Town forming the first cycle of data collection, Durban the second, and Johannesburg/Pretoria the last cycle of data collection for each typology. Table 9 describes the overall sample for the qualitative phase.

Table 9: Qualitative sample overall demographics

Total Sample N=44	
Gender	
Female	26
Male	18
Population group	
White	18
Black	15
Coloured/Mixed	4
Indian	4
Other/Refuse	3
Age	
18-25	11
26-35	17
36-45	8
46-55	8
56-65	0

Table 10 describes the demographics for each typology as well as the amount of codes generated per participant.

Table 10: Typology qualitative sample demographics

Typology 1					
	City	**Race**	**Gender**	**Age**	**Codes**
Participant 1	Cape Town	White	Male	18-25	91
Participant 2	Cape Town	Mixed	Male	46-55	139
Participant 3	Cape Town	Black	Male	18-25	156
Participant 4	Durban	Black	Female	26-35	152
Participant 5	Johannesburg	Black	Female	18-25	105
Participant 6	Johannesburg	White	Male	36-45	119
Participant 7	Johannesburg	Indian	Female	18-25	99
Typology 2					
Participant 1	Cape Town	Mixed	Female	36-45	121
Participant 2	Cape Town	Indian	Female	46-55	212
Participant 3	Cape Town	Refuse	Male	18-25	158
Participant 4	Durban	Indian	Female	26-35	277
Participant 5	Durban	White	Male	46-55	207
Participant 6	Johannesburg	Black	Male	26-35	222
Participant 7	Johannesburg	Black	Female	26-35	239
Participant 8	Johannesburg	Black	Female	26-35	163

Typology 3					
Participant 1	Cape Town	White	Female	26-35	237
Participant 2	Durban	White	Male	26-35	218
Participant 3	Johannesburg	White	Female	18-25	144
Participant 4	Johannesburg	White	Female	36-45	219
Participant 5	Johannesburg	Black	Female	18-25	157
Participant 6	Johannesburg	White	Female	36-45	224
Participant 7	Johannesburg	White	Female	18-25	309
Participant 8	Johannesburg	Black	Female	18-25	172
Typology 4					
Participant 1	Cape Town	Indian	Female	46-55	373
Participant 2	Cape Town	White	Female	26-35	595
Participant 3	Durban	Black	Female	18-25	559
Participant 4	Durban	White	Female	36-45	454
Participant 5	Johannesburg	Other	Male	36-45	458
Participant 6	Johannesburg	Black	Male	26-35	133
Participant 7	Johannesburg	Black	Male	36-45	315
Participant 8	Johannesburg	Black	Male	26-35	390
Typology 5					
Participant 1	Cape Town	Black	Male	26-35	412
Participant 2	Cape Town	White	Female	36-45	448
Participant 3	Cape Town	White	Male	46-55	553
Participant 4	Durban	Black	Female	26-35	206
Participant 5	Durban	White	Male	26-35	501
Participant 6	Johannesburg	White	Female	46-55	248
Participant 7	Johannesburg	White	Female	46-55	394
Typology 6					
Participant 1	Cape Town	Mixed	Female	26-35	251
Participant 2	Cape Town	White	Male	26-35	267
Participant 3	Durban	White	Female	46-55	334
Participant 4	Durban	Refuse	Male	18-25	564
Participant 5	Johannesburg	Mixed	Male	26-35	711
Participant 6	Johannesburg	Black	Female	26-35	499

3.3.2.2.2 Fieldwork journal

A fieldwork/research reflexive journal (White, 2008) was used to capture initial thoughts after each interview and also to make a note of any exciting observations (participant home, mood, dress). The journal assisted the researcher in reflecting on the impact the interviews had on her and to reflect on any issues that she might have brought to the interview process. Most participants were extraordinarily open and comfortable to share their personal experiences, life traumas, and vulnerabilities. This

provided great depth to the interviews and rich context for typological development. The researcher conducted all the interviews. This was beneficial as she had complete influence over the data collection process, the probing, and the intensity of data gathered. The fieldwork journal was revisited during the Grounded Theory Analysis to clarify context and interview experiences.

3.3.2.2.3 Cluster Mapping

Initial coding was done in conjunction with the fieldwork and was called cluster mapping (researcher's own term). This mapping process included making notes on large cardboards and noting initial codes as well as ideas that needed further exploration in each typology before moving into the next cycle of fieldwork. The ideas that formed the cluster maps for further exploring across cycles of fieldwork are noted in appendix 15. No significant guide changes were made so as not to influence the emergence of concepts but they were rather left to transpire naturally from the rest of the fieldwork. As such, the cluster mapping was used during the cycles of interviews and functioned as a method for theoretical sensitisation.

3.3.2.2.4 Transcription

The interviews were recorded with an audio recorder. Audio files were downloaded to a personal and password-protected computer. Professional transcribers and the researcher transcribed all the interviews verbatim. Transcribers were asked to sign confidentiality agreements (appendix 9) and delete audio files and transcripts after sending them to the researcher. The researcher also read through each of the 44 transcripts in conjunction with listening to the interviews to ensure that nothing was left out during the transcription process. During this process notes were also made of any emotion obvious during the interview and noted these in the transcripts should they not be there. All transcripts were anonymised and then loaded into ATLAS.ti (www.atlasti.com) for analysis.

3.3.2.3 Analysis

This section aims to describe the Grounded Theory Analysis used, the constant comparison technique, theoretical sampling and theoretical saturation, analytic memos, and typologies as outputs of the qualitative analysis component of the study.

3.3.2.3.1 Grounded Theory Analysis

3.3.2.3.1.1 Using CAQDAS

Grounded Theory was developed prior to CAQDAS (Computer-Aided Qualitative Data Analysis Software) and therefore the analytical steps are naturally suited to manual rather than computer aided analysis. Friese (2016) noted various benefits to using ATLAS.ti, a specific CAQDAS, in a Grounded Theory study namely; it is a paperless process, coding is done with the software building your coding lists as you move through analysis, sorting and re-structuring of codes is done easily, you can link your memo writing with the coding process, if you need to you can print out memos and associated writing from the software, and the software allows for seamless movement between transcripts, codes, memos,

categories, and code frequencies. Finally, ATLAS.ti has a code co-occurrence tool which outputs easily into frequencies to be used for additional analysis such as multi-dimensional scaling (MDS).

The software facilitates analysis but does not actually conduct the analysis. It does not present key themes or categories to the researcher and it is easy to end up with too many codes after initial coding, which was the case for most of the typologies. The software does not tell you whether your codes are correct and once codes are collapsed you need to re-code if you want to make changes. This also meant that to identify dimensions they had to be done in the overall category and could not be sorted into different dimensions. The software is unable to reach the level of abstraction required in Grounded Theory and it does not point out inconsistencies in coding. As such, although the software allows for a paperless environment where complexity is inherent in Grounded Theory, it does not do the analysis for the researcher but merely provides a platform for it to happen. Friese (2016) suggests using the NCT (Noticing, Collecting, Thinking) method when using CAQDAS in a Grounded Theory study and the subsequent coding processes. The NCT process is naturally inherent in qualitative analysis and intersected the various cycles of coding when drawing on the Grounded Theory method.

3.3.2.3.1.2 Grounded Theory

Grounded Theory originated from the examination of death and dying in health institutions, and was developed by sociologists Barney Glaser and Anselm Strauss in 1967 (Glaser & Strauss, 2006). Grounded Theory aimed to find an alternative methodology to hypothesis-based research that could be used to develop a theory to describe a phenomenon (Locke, 1996). Due to ontological differences, Glaser and Strauss parted ways, and two schools of Grounded Theory emerged; Glaserian post-positivist Grounded Theory and Straussian constructivist Grounded Theory that he developed with Juliet Corbin (Charmaz, 2006). Straussian Grounded Theory (Strauss & Corbin, 1998) views the researcher as an active interrogator of the data they gather to arrive at conceptual categories. Glaser feels that this approach contaminates the concepts that emerge and that researchers need to practice restraint, distance, and independence from the phenomena they study. For Glaser, the natural world is out there, which is in line with positivist traditions (Locke, 1996). Non-positivistic Grounded Theory views knowledge as a construction of meaning between the interpreter and the interpreted (Levers, 2013). This study draws on Straussian Grounded Theory because of its ontological alignment with the training of the researcher (non-positivistic) and epistemologically it is aligned with the pragmatic approach of the research (Bryant, 2009; Suddaby, 2006). The Grounded Theory process is described by figure 4 below (Buckley & Waring, 2013).

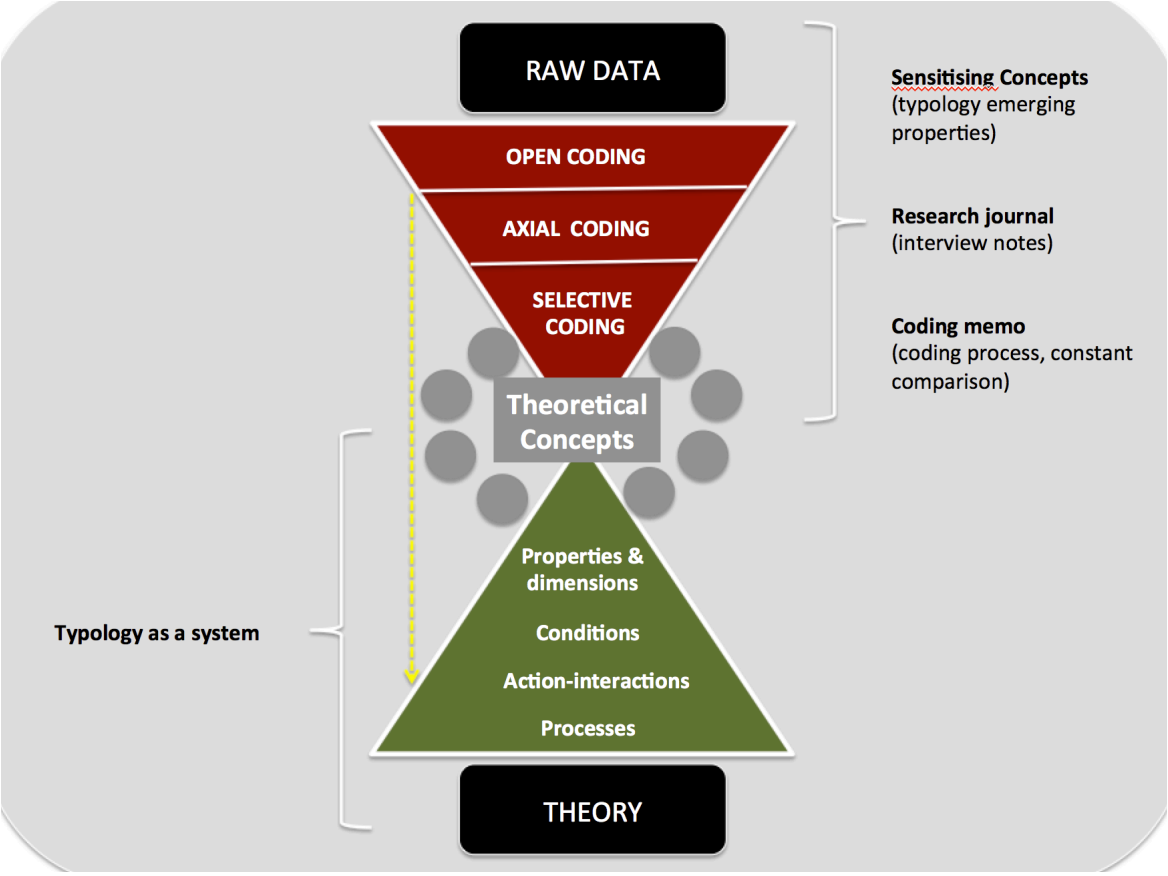


Figure 4: Straussian Grounded Theory using a pragmatic approach (figure was designed by the researcher)

Grounded Theory provides an opportunity to explore typologies identified in the quantitative phase, it gives a structure for analytical processes, encourages researcher creativity as well as flexibility, allows for the data to be scrutinised from various angles (Strauss & Corbin, 1998) and promotes the elicitations of new understanding of relationships and how these relationships construct reality (Glaser & Strauss, 2006). Grounded Theory explores social processes and builds categories through cycles of coding to provide the theoretical support for the emerging theory that is grounded in the data (Strauss & Corbin, 1998). Ideally, Grounded Theory requires a tabula rasa. This was not possible, as it was required to provide a proposal literature review and develop a quantitative survey for the thesis. That being said, tabula rasa does not mean ignoring general areas related to the study (Suddaby, 2006) it is just specific literature to avoid the researcher testing hypothesis (even if subconsciously). Although the analysis was approached with a general understanding of the field, the qualitative data analysis was undertaken without any *a priori* coding frameworks or families. This allowed the codes, categories, dimensions and theory to emerge naturally from the data through a process of interpretation.

Grounded Theory generates middle-range theory through identifying a core category and process categories that explain it. This theory is an abstract understanding of a phenomenon grounded in the data (Strauss & Corbin, 1998). The theory is wedged close to the data, which makes it different to grand theories that are applicable to many people. The theory is a middle range theory that provides an explanation for a substantive topic (Charmaz, 2006). Three main criteria guided the process of theory development: the theory must emerge logically and systemically from the data; the theory in its abstraction must still be able to reflect accurately what is described in the data (having gone through

cycles of deconstruction and construction); and the theory needs to be practically useful to the field (Charmaz, 2006). Strauss and Corbin (1998) provide the following guidelines for ensuring that the theory is grounded:

- Concepts need to emerge from the data
- Concepts cannot be mutually exclusive as they form part of an emerging system
- Categories should be well developed and stable
- The theory needs to have emerging variation
- The theory needs to consider elements that have the potential to impact the viability of the theory related to the phenomenon
- The analytical process of theory development needs to be traceable. In order to create traceability of the main theoretical constructs each cycle of coding was saved in a different folder in ATLAS.ti to show the processes in order to get to the major theoretical concepts and constructs. The reflexive journal and analytical memos added to the process of creating variation in the theory
- The theory needs to be substantive and useful

Emergence is a non-linear process that gives systems their complexity (De Haan, 2006). Emergence is a phenomenon that can be identified, but it transcends the elements that produce it (De Haan, 2006). A method used to encourage emergence during this part of the study was the constant comparative technique (Boychuk, Duchscher, & Morgan, 2004). It is acknowledged that emergence in the context of the study happened through subjective interpretation rather than objective observation.

3.3.2.3.1.3 Constant Comparison Technique

Grounded Theory is a recursive process (Locke, 1996) that allows for emergence (Levers, 2013) through using the constant comparative technique (Cho & Lee, 2014). Iteration took place on many levels. It took place through and within cycles of open, axial, and selective coding (Bohm, 2004). Saldaña (2009) describes coding as a word or phrase that assigns a symbolically salient attribute to a participant statement. Coding explores the data in search of patterns of similarity, difference, frequency, sequence, correspondence, or causation. Coding was used as a heuristic, to link data to the typology and ultimately to the quantitative data. It was a cyclical process to develop categories, properties, and dimensions through exploring meaning and then building theory. Iteration continued by moving back and forth between data sections and codes, back and forth between participants in a typology, back and forth between different typologies, and at the end of the process of finalising the theory, there was a back and forth movement between the qualitative and quantitative data in order to design the joint displays with the most salient system elements.

The constant comparison technique was also useful to confirm whether categories and properties were emerging across participants in the typology since the principle of synecdoche (where the part is made to represent the whole, and the whole is meant to represent the parts) was used (Hallberg, 2006). Where they were not applicable to all cases, they were treated as not pertinent (Bowen, 2008) and the category or property was rejected. Where there were negative cases, these were resolved through the inclusion of dimensions that is a process that allows for variability. Furthermore, the constant comparison

promoted theoretical sensitivity as it happens in tandem with theoretical sampling (Locke, 1996). In order to trace the process of constant comparison, analytic memos were used.

3.3.2.3.1.4 Analytic memos

During the analysis process a record of emerging codes and associated thinking was kept through memo writing in the ATLAS memo function as well as in a detailed word document. The memos (per typology) contained the codes, content descriptions and brief data examples for reference. This also functioned as a route to theoretical sampling (Saldaña, 2009). The memo writing was also used as a way to write down thoughts about emerging concepts and make note of the interactions with the data asking what, who, how, when, why, etc.? In addition to keeping track of codes and having dialogue with the data, it was also used to keep a record of how the theory emerged and metamorphosed through processes of open, axial, and selective coding (Draucker, Martsolf, Ross, & Rusk, 2007).

3.3.2.3.1.5 Coding

3.3.2.3.1.5.1 Open coding

Open coding is also called line-by-line coding (Strauss & Corbin, 1998) since you code every line or sentence individually in a process that is similar to the fragmentation of stories. This process is about remaining open to all theoretical directions, sticking close to the data, and having no pre-existing themes or categories applied (Charmaz, 2006). During this phase each transcript was read through in its entirety using a combination of *in vivo* coding (using participant words verbatim) as well as using symbolic attributes to describe the key feature of the sentence being described by the participant (Bohm, 2004). During this phase references were made back to the reflexive journal and cluster maps. According to Friese (2016) this process forms part of the Notice and Collect process of the noticing-collecting-thinking-method (NCT). At this stage of the coding there are no coding groups, no colours allocated, and no linking between codes or quotations. It is a basic process of introducing ones' self to the data as an initial step of making sense of what participants were saying. This process was relatively structured as each transcript was worked through one at a time (Strauss & Corbin, 1998).

During the second tranche of this coding process the codes were grouped in order to reduce the number of codes generated from the line-by-line coding. Grouping of the codes was based on comparisons, searching for similarities, differences, or links. During this process each code was grouped according to how it contributed to building a framework for the emergent theory. To take the coding grouping process further, where relevant the lines of quotes were re-coded or expanded to capture the inherent meaning and associated context (Charmaz, 2006).

Next followed a process of moving through the code groups to create sub-codes within each code group by determining the properties of each code group, delineating the scope of each code group, asking questions about each code group, and then identifying hierarchies and testing those hypotheses by going back to the raw data and looking for more incidences that support that code group or the inherent sub-codes. During this process code groups and sub-codes were constantly reworded, merged, and re-

coded as part of a continuous attempt to ensure they were descriptive and conceptually representative of the emerging phenomena (Strauss & Corbin, 1998). Open coding moved naturally to axial coding.

Code frequencies became fewer as theoretical saturation was achieved, not because there were fewer codes but because all the initial codes get rolled up into overarching categories (see Table 11).

Table 11: Code frequency per coding phase

	Open coding	**Axial coding**	**Selective coding**
	Codes		**Categories**
Typology 1	1630	26	9
Typology 2	1798	29	11
Typology 3	1894	30	12
Typology 4	1880	37	13
Typology 5	1356	25	13
Typology 6	1199	27	14

3.3.2.3.1.5.2 Axial coding

Axial coding is the process of identifying key categories and then coding around them. This is a process that brings the data back together into a new coherent whole, a single category at a time, at the centre of analysis (Bohm, 2004; Strauss & Corbin, 1998). During this coding, relationships between category, code groups, sub-codes, and context were identified. At this point codes and merged sub-codes were renamed to increase the degree of abstraction of a category (Friese, 2016). While this process was unfolding, its relationship to other categories as well as the expansion of the emerging categories and their properties occurred. At this point questions were asked about the relationship of a specific code group and the other code groups or sub-codes as well as reflecting on the central phenomenon and how the contexts relate to each other.

Once the core category was confirmed a hierarchical coding structure was built in an attempt to start building a theory and testing the hypothesis in the context of the overall data. The major part of axial coding takes place during the writing of memos and forms the thinking part of the NCT method (Friese, 2016). Although memo writing took place during each cycle of coding, it is during this coding phase where building the emerging theory happened. In order to ensure the theoretical pins were well suited to hold the theory it was necessary to move between the abstraction achieved back to a descriptive level of the data to make sure all links, induction, and deductions were supported up to this point. ATLAS.ti makes provision for testing strong and weak links with network analysis functionality. Weak links were abandoned through subsuming them into other categories or sub-categories. The final step was selective coding.

3.3.2.3.1.5.3 Selective coding

The goal of selective coding was theoretical saturation (Draucker et al., 2007) and the incorporation of variability (Bohm, 2004). Saturation involves bringing a fractured story back together in order to describe a coherent analytical story (Bowen, 2008; Charmaz, 2006). Saturation is achieved through reaching empirical limits of the data, the integration and density of the theory and the analyst's theoretical sensitivity (Glaser & Strauss, 2006). The process included going back to the raw data and sampling for varied cases in order to create variation in a category (which would form dimensions of categories) and analytic density in the theory (Charmaz, 2006; Draucker et al., 2007). All categories had to emerge amongst all participants in a typology and in order to test this the data and theory were constantly compared and contrasted until nothing new emerged, but all emergent categories were applicable to all participants in a typology (Locke, 1996).

Once theoretical saturation and variability were achieved, the role of each element in the theoretical system was confirmed (Draucker et al., 2007). This was done through concretisation of category properties, dimensions, micro- or macro-conditions (the circumstances or situations that form the structure of the studied phenomena), actions/interactions (participants' routine or strategic responses to issues, events or problems), consequences (outcomes of actions/interactions), choosing a core category, connecting these emerging categories, and then expanding them further (Bohm, 2004; Strauss & Corbin, 1998).

3.3.2.4 Validation

Incorporating a validation procedure is important in order to decrease the likelihood of qualitative results being criticised for lacking rigour, being an intuitive process, and being subjected to researcher bias (Bowen, 2009). Bowen (2009) suggests an audit trail be used to increase the trustworthiness of Grounded Theory. An audit trail provides documentation (reflexive journal and memos) on decisions and interpretation as the analysis moved from the raw data to theory so as to make the process visible and verifiable (Creswell & Miller, 2000). The purpose of the trail was to demonstrate that the theory and its elements were grounded in the data. The audit trail was summarised into a document for auditing purposes (Creswell & Miller, 2000).

An independent auditor (recommended by a faculty member) familiar with Grounded Theory was commissioned to audit the Grounded Theory developed and a study background document was provided (appendix 13). The aim of auditing was to check the trustworthiness of the Grounded Theory process and theory. Trustworthiness is the qualitative equivalent to the positivistic concept of validity, reliability, and objectivity (Bowen, 2009). The auditor evaluated credibility, transferability, dependability, and confirmability. Credibility is the qualitative version of positivist internal validity (Sikolia, Biros, Mason, & Weiser, 2013) but here refers to the degree to which one can trust that the findings represent truth (Creswell, 2003). A way of establishing credibility is using triangulation, meaning the use of more than two data sources and methods (Annells, 2006; Creswell & Miller, 2000). This study was a mixed methods process combined with the member checking that provided validation through corroboration (Bowen, 2009). Transferability corresponds to external validity (Sikolia et al., 2013) and is achieved in

qualitative research through thick descriptions, quotations, interpretation of results, and the audit trail (Sikolia et al., 2013). Dependability is the qualitative equivalent of the quantitative concept of reliability and is the idea that the findings are stable over time (Sikolia et al., 2013). Confirmability tests the objectivity of the research through establishing internal coherence of the data in relation to the findings, interpretations, and recommendations via the audit trail (Bowen, 2009).

Credibility, transferability, dependability and confirmability operationalise rigour and relevance. Eppler, Hoffman and Pfister (2011) describe various elements of rigour and relevance for evaluating typologies. Rigour includes classification criteria that are aligned with the field and the typologies should be mutually exclusive, and therefore importance is placed on areas where differences emerge between typologies, and less attention is given to issues where there is less agreement. Furthermore, a typology should include sufficient focus on granularity, membership criteria should be described, and there should be clear group boundaries. The relevance of typologies requires simplicity in the structure of the typology, visual clarity, usefulness, categories that use common attributes for distinctions as well as unique and self-explanatory labels (Eppler et al., 2011). The auditing process included evaluating the rigour and relevance of the typologies developed.

The auditor was provided with the following documents:

- Auditing introduction document with background to the study and the need for a Grounded Theory audit
- Interview guide
- Auditor confidentiality agreement
- Enabling technique used
- Detailed auditing document per typology containing
    - Sensitising concepts that emerged during the cycles of interviews
    - Grounded Theory process
    - Open coding and associated questions
    - Emerging codes and categories
    - Axial coding elevated codes
    - Axial coding questions
    - Axial coding emerging key categories
    - Selective coding processes
    - Conceptual table and elaboration of each category
    - Quotation examples for each category and dimension
    - Working theory
    - Draft systems model
- For each typology ATLAS.ti export codebooks were done for each level of coding
- Lists of codes and associated groups were exported from ATLAS.ti
- Lists of code groups and their members were exported from ATLAS.ti

The findings of the audit are detailed in appendix 11. The auditor indicated that the method section clearly documented the analytical process followed, the rationale for research decisions were clearly

presented and further clarified, the reflexivity journal provided adequate substantiation for the subjective and intuitive processes followed, the analysis reflected and followed through on the methods applied, member checking provided validation of the representation of participants' realities, triangulation was achieved, and the analysis was adequately reflected in the data. The recommendations made by the auditor was for the researcher to add thicker descriptions for the categories and properties, ensure that categories are generalisable, make a clearer primary name holder for each typology for comparative purposes and to consider the influence of outliers. The researcher ensured thick description of the categories and properties in the full qualitative chapter with dimensions added for properties ensuring increased generalisability and the consideration of outliers.

The second method of validation was done through member checking, which is verifying results and interpretations with study participants (Onwuegbuzie & Daniel, 2003). Member checking shifts the validity procedure from researcher to the participants (Creswell & Miller, 2000). Member checking was done in parallel with the Grounded Theory audit. Participants who took part in the qualitative phase of the study were sent an e-mail (appendix 10) asking them for their final input on whether they feel the typological narrative describes them generally. Participants were told that if they agreed with the statement no reply was required. In total 21 participants, across typologies, provided e-mail feedback on the typological narratives.

The final feedback received from the auditor was incorporated into the Grounded Theory in conjunction with the relevant member checking feedback before finalising the Grounded Theory for each of the typologies. The auditor provided a confirmatory letter after all agreed changes and explanations were sufficient (appendix 11).

3.3.3 Building systems

Since "linking" is at the core of system dynamics, Grounded Theory speaks to the same aim of drawing relationships among categories in the typological system (Luna-Reyes & Andersen, 2003). Although qualitative data are important in the development of a system dynamics model, there is no clear explanation about how or when to use them (Luna-Reyes & Andersen, 2003). The Grounded Theory elements (category properties, dimensions, micro- or macro-conditions, actions/interactions, consequences) were used in combination with key quantitative insights to build the typological systems and finalise the typological theory through a joint display. Categories become stocks and flows for the system dynamics model. In order to provide a robust system dynamics model, the strength of the relationship between categories needed to be understood so as to interpret system flows. In order to determine the proximity of relationships multidimensional scaling (MDS) analysis was conducted on the qualitative data that was exported from the Atlas.ti code co-occurrence tool.

MDS is a statistical procedure that measures similarity empirically (Hout, Papesh, & Goldinger, 2013). The output from the MDS process is a similarity "map" that quantifies the perceived relationships among the categories. The axes in an MDS do not have meaningful labels. They are measures of distance (similarity/dissimilarity) without interpretable meaning. During the analysis, algorithms (of which there

are a range) move each item in the space (in an iterative manner) to a location relative to the other items that, as best as possible, respects the raw similarity ratings provided by the participants (Hout et al., 2016). MDS is fundamentally spatial; thus, items rated as being highly similar to one another should be in close proximity to one another in the final output to the degree that any two items are rated as dissimilar, the distance between them should grow. These “distances” are measured in k-dimensional Euclidean space. Model fit, or the degree to which the output space conflicts with the raw ratings, is reflected in a measure known as stress. When the algorithms have completed their iterations (optimisation criteria vary, and usually rely on changes in stress), dimensional coordinates for each item can be used to create a visual representation of the outcome, as well as to quantify similarity as the distances between each pair of objects in the space (Hout et al., 2016).

The outputs from the quantitative phase of the study were combined with the Grounded Theory outputs and MDS to develop typological system dynamics shown and described in the Integrative results chapter.

3.3.4 Analytic lens

In Grounded Theory researchers must state their positions in the research process as part of a self-reflective process. This ensures they take notice and account for personal biases, worldviews, and assumptions while collecting, interpreting, and analysing data (Charmaz, 2006; Suddaby, 2006). It is therefore necessary to write this section in the first person, even if this jars somewhat from the rest of this chapter.

3.3.4.1 Analytical lens: self-reflection

I worked for many years as a qualitative research specialist and then consumer psychologist in the consumer research industry. My primary field of expertise was using qualitative research to build typologies for blue chip companies and assisting them with brand and product positioning and targeting around these types of people. Based on the research, usually conducted across African countries, I then suggested key intrinsic and extrinsic qualities that could be used in communication campaigns, brand positioning and strategic directions. I grew up in Johannesburg, very disconnected from nature. I never spent much time outside, never considered the impact of my lifestyle and eating choices on the environment and had never heard of climate change. A brief series of events, sparked by social media, shattered my entrenched worldviews and I eventually became vegan for ethical reasons. After becoming vegan my life started to transform with new emergent worldviews to the extent that my environmental views and views on animals form a dominant part of my identity. This radical transformation left me informed and concerned about the climate crisis and the disconnect people have with the problems facing the natural and animal world. Fascinated by my own journey of enlightenment I became curious as to what types of relationships people have with the natural world and animals and what influences those relationships. This interest and passion for making the world a better place led me to close my consumer research business and pursue my PhD. The conceptualisation and execution of the study was influenced by my experience as a researcher, my understanding of ecopsychology, and the identified need to merge data with individual stories and experiences as a pathway to uncovering the

underlying psychological processes that influence the complexity of the human-nature nexus. As such, I understand that the lens through which I view my research and the data may be influenced by my current worldview but it is also strengthened by my passion to understand how to reconnect those who are detached, because it is possible: it happened to me.

3.3.4.2 Ethical considerations

This section aims to describe some reflections on ethical considerations with regards to the quantitative and qualitative phases of the study. Ethical considerations during the study were explored in the context of removing barriers to participation in order to allow people who wanted to participate, to be able to do so.

The first ethical consideration during the quantitative phase was sourcing lists with individual contact details in order to invite people to participate in the research. Since the lists contained only contact details (no other identifying information) of individuals who opted into participating in research studies, this was not considered a problem. Individuals who did not respond to the invitation to participate were considered not interested and their contact information removed. Another ethical consideration for this phase was using social media for participant recruitment. Social media invitations were not personally targeted at individuals and individuals could choose to scroll past the banner or click on it to be taken to the participant information sheet. Participants were never identifiable to the researcher until such time that they agreed to participate and to not remain anonymous. The participant information sheet explained in detail what the study was about and what each of the phases would entail. Participants were reassured that they had the option to remain anonymous or opt out of the study at any given time. Since contact details were only asked at the end of the questionnaire (to volunteer for participation in the qualitative research and/or to be entered into the lucky draw) participants could choose to opt out of the research at any give time while completing the questionnaire or thereafter (through opt out buttons). Participants could also choose to remain anonymous. Another ethical consideration was the use of a lucky draw. This was strategically used for the study to firstly encourage participation in a very long questionnaire. Secondly, since the study focused on environmental concern and issues, the researcher anticipated that only environmentally concerned people would participate if no other motivation was provided. The lucky draw was effective in reducing bias in participation (i.e. only ecocentric people participating). The statistician had access to un-anonymised data but this was not considered an ethical challenge because she is a member of the South African Statistical Association (SASA), and is bound by its Constitution, specifically its Code of Conduct, which includes to requirement to protect the identities of all participants in experiments, surveys and observations (Section A.4.2). Furthermore, as a registered Professional Scientist with the SA Council for natural Scientific Professions (SACNASP) (reg. no. 400052/14) she is also bound by its Code of Conduct, which requires her to ‘Discharge their duties in compliance with applicable ethical principles, relevant legislation and standards in the field of practice’ (Section 3); protecting the confidentiality of participants is a cornerstone of ethical statistical practice. There were no foreseen risks to the individuals participating in the study.

An ethical consideration of the qualitative phase of the study was providing participants with R200 compensation. This was not deemed an issue and seen as a polite gesture for expenses participants

had to incur (transport, calls, baby sitter) to participate in the face-to-face interview and therefore not considered coercive. An important ethical consideration was to recruit and brief transcribers on the expected ethical standards as outlined for human (non-medical) studies. Confidentiality of the data was an ethical consideration as transcribers had access to audio-recordings of the interviews. Although the researcher anonymised the file-names of the audio recordings, participants often introduced themselves while the interview was being recorded. Transcribers were asked to sign an agreement stating that all the information from the interview recordings would be treated with confidentiality and not to disclose any of the information and keep it safe/password protected. Once the transcription was completed, they had to agree to permanently delete the audio and transcript files from all the devices. For the qualitative analysis participants were labeled according to their typology and given a non-identifying random participant number. All data obtained were saved on a personal, password-protected computer. Participants were asked to consent to be audio recorded and the recordings transcribed for analysis. The consent forms assured participants that their participation was voluntary, no identifying information would be included in the thesis and responses would remain confidential, that they had the right to withdraw at any time, that they did not have to answer any questions or provide any information that made them feel uncomfortable, and that they had the right to request the transcript of the interview. They also consented to direct quotes to be used anonymously for reporting. The consent forms were scanned in and password-protected, with hard copies destroyed.

3.3.5 Summary

This chapter described the mixed methods process used during the study. This chapter moved through describing the measurement design that included the identification of constructs included in the questionnaire. The second phase described the quantitative data collection, including the online tool used, participant sourcing, piloting of the survey and consideration of fieldwork ethics. The third phase included the analysis of the quantitative data through the description, scoring, Factor Analysis, Cluster Analysis, profiling and Discriminant Analysis. The fourth phase was a process of linking the quantitative phase with the qualitative phase through recruitment, designing an interview guide, development of an enabling technique and conducting pilot interviews.

The qualitative phase was described through exploration that included interviews, fieldwork journaling, cluster mapping and transcription. Stage six consisted of the qualitative analysis and described the Grounded Theory analysis, constant comparison technique, analytic memos and the various coding processes. Following the analysis, validation was described that included an audit and member checking. Building systems, the eighth phase, describes MDS and the linking of both the quantitative and qualitative results through joint displays, typological systems and theory. Finally, this chapter describes a reflection on the analytic lens and ethical considerations of the researcher.

The following two chapters report the results for the quantitative and qualitative phase of the study.

CHAPTER 4

QUANTITATIVE RESULTS

4.1 Introduction

To develop typologies for understanding the relationship that people have with the biosphere in South Africa they need to be identified and described before they can be explored in the qualitative phase. This chapter presents the results of the cluster analysis that identified and described the typologies. The clustering variables comprised connectedness to nature, shifting responsibility, the role of the individual, human-centric concerns, resource-centric concerns and science-centric concerns. The profiling variables comprised environmental worldviews, climate-centric concerns, animal exploitation, animal extinction, the role of the government, role of technology, behaviour, values and personality. Through this set of variables heterogeneous typologies were identified and described.

4.2 Identification and sizes of typologies

Six differentiated and meaningful typologies emerged after K-means cluster analysis was conducted on 721 out of 753 completed surveys (the rest had one or more variables with missing data). A 4, 5 and 6-cluster option was applied. The 6-cluster solution proved to be the most meaningful and differentiated, taking the clustering and profiling variables into account as well as their collective ability to describe the types. The suitability of six typologies was confirmed using Pseudo-F (see Calinski & Harabasz, 1974). The results showed a Pseudo-F of 178.1 for six clusters versus 173.8 (four clusters), 177.0 (five clusters), and 168.4 (seven clusters) confirming six as the best number of groups. The sample sizes for the six typologies were sufficient for meaningful interpretation. Typology labels were generated during the qualitative phase of the research but are introduced here as the *Disconnected* (Dis), *Observer* (Obs). *Misunderstood* (Mis), *Hero* (Her), *Explorer* (Exp) and *Hedonist* (Hed).

Table 12 shows the cluster size for each of the identified typologies. The *Misunderstood* was the largest group at 24.4%, and the *Disconnected* the smallest at 10.4%. The difference in cluster sizes might be due to varying interest in the subject matter for example, those less interested in environmental issues (the *Disconnected* and the *Hedonist*) have the smallest cluster sizes.

Table 12: Typology sizes

	Overall	Dis	Obs	Mis	Her	Exp	Hed
Total	721	75	120	176	104	170	76
%	100	10.4%	16.6%	24.4%	14.4%	23.6%	10.5%

4.3 Typology distances

Based on the cluster analysis and distance calculations, some typologies are closer to each other and others are further apart. Euclidean distance was based on the cluster analysis and was calculated as

the square root of the average of the square difference between the attributes of the observations. Euclidean distance between two clusters x and y was calculated using the below equation where i is each variable used in the clustering.

$$d(x,y) = \sqrt{\sum_{i=1}^{m}(x_i - y_i)^2}$$

The distances combined with significant ANOVAs and meaningful profiling confirmed well-differentiated typologies.

Table 13 shows Euclidean distances between typologies with those that are further apart indicated in red and those that are closer to each other in green. The *Observer* and the *Hero* have the shortest distance between each other (0.643) and, the *Observer* and the *Explorer* (0.675) and the *Observer* and the *Misunderstood* (0.709) also have a relatively short distance between each other. The *Explorer* and the *Hedonist* are the furthest apart (1.584) with the *Disconnected* and the *Explorer* (1.312), the *Observer* and the *Hedonist* (1.212), the *Hero* and the *Hedonist* (1.330) also respectively far apart. The close distances between the *Observer* and the *Misunderstood*, *Hero*, and *Explorer* might suggest the *Observer* as a potential transitional typology, as they might be open to change or they readily conform to what others are doing (as will be described in Section 5.3).

Table 13: Euclidean distances heat map

	Euclidean distances between typologies					
	Dis	**Obs**	**Mis**	**Her**	**Exp**	**Hed**
N	75	120	176	104	170	76
Dis	0.000	0.769	0.877	0.734	1.312	0.876
Obs	0.769	0.000	0.709	0.643	0.675	1.212
Mis	0.877	0.709	0.000	0.820	0.836	0.868
Her	0.734	0.643	0.820	0.000	0.809	1.330
Exp	1.312	0.675	0.836	0.809	0.000	1.584
Hed	0.876	1.212	0.868	1.330	1.584	0.000

Distances further apart – red

Shorter distances – green

4.4. Clustering variables

Two sets of variables were used for identifying typologies namely variables used for cluster analysis and those used for profiling. After the factor analysis was completed, variables for the cluster analysis were selected based on sample size and correlation with each other, as determined by Spearman's rank correlation. For those moderately or highly correlated, one was considered for the cluster analysis and the other for cluster profiling since seven clustering variables were required. These variables were explored in numerous iterations where they played the role of a clustering variable and then a profiling

variable. Variables chosen for the final cluster solution were made based on stability, clarity, and uniqueness.

Table 14 shows how each of the typologies performed on the clustering variables: connectedness to nature, shift in responsibility, the role of the individual, human-centric, resource-centric, and science-centric variables. Effect size was determined by η2.

Table 14: Typologies and their performance on connectedness to nature and environmental issues and attitudes clustering variables

	MEAN									
Typology	**Dis**	**Obs**	**Mis**	**Her**	**Exp**	**Hed**	**Overall**	**SCALE range**	**ANOVA**	**η^2**
Connectedness to nature	3.80	4.43	5.04	5.25	5.93	4.16	4.96	1–7	F(5,721)=190.5*	.57
Shifting responsibility	3.39	2.05	2.01	3.41	1.62	2.36	2.32	1–5	F(5,721) = 212.57*	.60
Role of individual	3.95	3.99	4.16	4.37	4.41	3.55	4.12	1–5	F(5,721) = 32.39*	.18
Apathetic attitudes	3.20	2.33	2.07	2.58	1.67	3.04	2.30	1–5	F(5,721) = 98.78*	.41
Human-centric	3.56	4.06	3.71	4.31	4.47	2.48	3.89	1–5	F(5,721) = 149.63*	.51
Resource-centric	4.36	4.73	4.47	4.80	4.81	3.35	4.49	1–5	F(5,721) = 123.62*	.46
Science-centric	3.36	4.25	2.55	3.95	4.29	2.00	3.47	1–5	F(5,721) = 281.86*	.66

*p<.0001

Figure 5 is a line graph aimed at showing visually how the typologies trend across connectedness to nature, shifting responsibility, role of individual, apathetic attitudes, human-centric, resource-centric and science-centric.

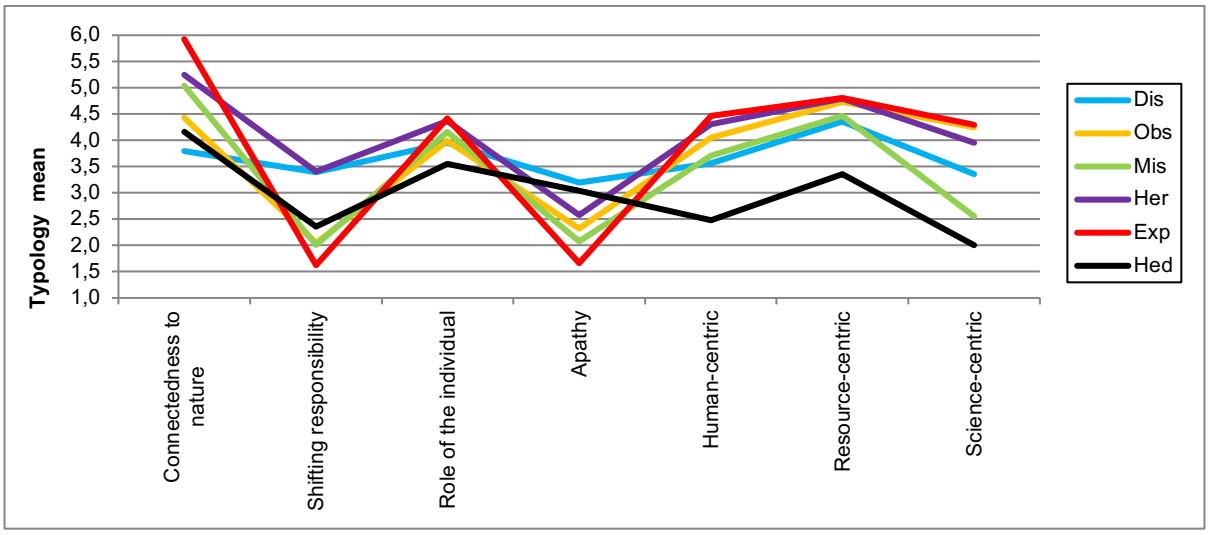


Figure 5: Typology similarity and differences on clustering variables

Table 15 shows significant differences between typologies. Green dots indicate statistically significant differences whereas the red dots show non-significant differences between typologies. To correct for Type 1 error the Benjamini-Hochberg procedure was used.

Table 15: Significant differences between typologies on clustering variables

N=721	Dis vs Obs	Dis vs Mis	Dis vs Her	Dis vs Exp	Dis vs Hed	Obs vs Mis	Obs vs Her	Obs vs Exp	Obs vs Hed	Mis vs Her	Mis vs Exp	Mis vs Hed	Her vs Exp	Her vs Hed	Exp vs Hed
Connect-edness to nature	🟢	🟢	🟢	🟢	🟢	🟢	🟢	🟢	🔴	🟢	🟢	🟢	🟢	🟢	🟢
Shifting respons-ibility	🟢	🟢	🔴	🟢	🟢	🔴	🟢	🟢	🟢	🟢	🟢	🟢	🟢	🟢	🟢
Role of individual	🔴	🔴	🟢	🟢	🟢	🔴	🟢	🟢	🟢	🔴	🟢	🟢	🔴	🟢	🟢
Apathetic attitudes	🟢	🟢	🟢	🟢	🔴	🟢	🟢	🟢	🟢	🟢	🟢	🟢	🟢	🟢	🟢
Human-centric	🟢	🔴	🟢	🟢	🟢	🟢	🟢	🟢	🟢	🟢	🟢	🟢	🔴	🟢	🟢
Resource-centric	🟢	🔴	🟢	🟢	🟢	🟢	🔴	🔴	🟢	🟢	🟢	🟢	🔴	🟢	🟢
Science-centric	🟢	🟢	🟢	🟢	🟢	🟢	🟢	🔴	🟢	🟢	🟢	🟢	🟢	🟢	🟢

🟢 Statistically significant

🔴 Non-significant

The connectedness to nature scale (see Mayer & Frantz, 2004) measured biophilia (see Kellert & Wilson, 1993). The overall ANOVA was significant: $F(5.715) = 190.5$; $p<0.0001$. Post-hoc tests showed that the mean score differed significantly between all typologies except between the *Observer* and the *Hedonist*. The effect sizes were large except for the *Misunderstood* and the *Hero* (small; d=0.39) and

the *Disconnected* and the *Hedonist* (moderate; d=0.51). The *Hero* ($\bar{x}$ = 5.25) and the *Explorer* ($\bar{x}$ = 5.93) had the highest scores indicating that they feel a sense of community and kinship with the biosphere encouraged by egalitarianism and belongingness. The *Disconnected* ($\bar{x}$ = 3.8) scored the lowest indicating that they are likely to feel disconnected from the biosphere and they perceive humans as dominators of nature.

Shifting responsibility included the perception that environmental impacts, domestic animal issues, farm animal issues, and wild animal issues are overstated and that they are the problem of future generations. It also included the perception that wild animals are commodities to be exploited for financial gain. The overall ANOVA was significant: $F(5.715) = 212.57$; $p<0.0001$. Post-hoc tests showed that the mean score differed significantly between all typologies except between the *Disconnected* and the *Hero* as well as between the *Observer* and the *Misunderstood*. The effect sizes were moderate to large. The *Explorer* ($\bar{x}$ = 1.62) scored the lowest indicating that they feel a sense of urgency and responsibility relating to environmental and animal issues whereas the *Hero* ($\bar{x}$ = 3.41) scored the highest. This might suggest that although the *Hero* feels affect towards nature, they feel powerless to do anything since their focus is on how to assist individuals.

Role of the individual measured the attitude that individuals should make a difference through contributing positively to the environment, animal welfare, and animal protection (domestic, farm, wild). The overall ANOVA was significant: $F(5.715) = 32.39$; $p<0.0001$. Post-hoc tests showed that the mean score differed significantly between all typologies except between the *Disconnected* and the *Observer*, the *Disconnected* and the *Misunderstood*, the *Observer* and the *Misunderstood*, the *Misunderstood* and the *Hero*, the *Hero* and the *Explorer*. The effect sizes were moderate to large. The *Explorer* ($\bar{x}$ = 4.41) scored the highest and the *Hedonist* ($\bar{x}$ = 3.55) the lowest, suggesting that the *Hedonist* does not take individual responsibility for environmental issues. The reasons for this attitude will be explored in section 5.7.

Apathetic attitudes included finding it too much effort to change, seeing the environment not as a priority, and that climate change is too far in the future to be of concern. For apathy the overall ANOVA was significant: $F(5.715) = 98.78$; $p<0.0001$. Post-hoc tests showed that the mean score differed significantly between all typologies except between the *Disconnected* and the *Hedonist*. The effect sizes were moderate to large except for the *Observer* and the *Misunderstood* and between the *Observer* and the *Hero* where the effect sizes were small. The *Disconnected* ($\bar{x}$ = 3.20) and the *Hedonist* ($\bar{x}$ = 3.04) were the most apathetic and the *Explorer* ($\bar{x}$ = 1.67) the least apathetic. Apathetic attitudes explain why the *Hedonist* lacks a sense of individual responsibility towards the environment, and has a poor relationship with the biosphere.

Human-centric concerns included human overpopulation, loss of natural areas, waste generation, urbanisation, over consumption, and biodiversity loss. The overall ANOVA was significant: $F(5.715) = 149.63$; $p<0.0001$. Post-hoc tests showed that the mean score differed significantly between all typologies except between the *Disconnected* and the *Misunderstood*, the *Hero* and the *Explorer*. The effect sizes were moderate to large. The *Explorer* ($\bar{x}$ = 4.47) and the *Hero* ($\bar{x}$ = 4.31) scored the highest

and the *Hedonist* ($\bar{x}$ = 2.48), the lowest. The *Hero* and the *Explorer* possibly have a broader degree of concern for human-related issues compared to the *Hedonist,* who only focus on themself.

Resource-centric included concerns about air pollution, water scarcity, natural resource depletion, and water pollution. The overall ANOVA was significant: $F(5.715) = 123.62$; $p<0.0001$. Post-hoc tests showed that the mean score differed significantly between all typologies except between the *Disconnected* and the *Misunderstood*, the *Observer* and the *Hero*, the *Observer* and the *Explorer*, the *Hero* and the *Explorer*. The effect sizes were moderate to large. All typologies were concerned about resource-centric issues except for the *Hedonist* ($\bar{x}$ = 3.35) who showed the least concern. This lack of concern could be due to a lack of awareness since environmental issues are not a primary lens for this typology. Interestingly these issues are a concern for the *Disconnected* that could indicate that these issues impact them personally since they have a poor relationship with the biosphere.

Science-centric included concerns about nuclear energy, pesticides, and GMO. For science-centric the overall ANOVA was significant: $F(5.715) = 281.86$; $p<0.0001$. Post-hoc tests showed that the mean score differed significantly between all typologies except between the *Observer* and the *Explorer*. The effect sizes were moderate to large. The *Explorer* ($\bar{x}$ = 4.29) and the *Observer* ($\bar{x}$ = 4.25) scored the highest on these issues. The *Explorer* scored high due to the concerns about all environmental issues. The *Observer* might be concerned about these issues for different reasons to be explored in section 5.3. The *Hedonist* ($\bar{x}$ = 2.00) was the least concerned.

4.5 Typology profiles

Variables used for profiling were those that correlated highly with others, had a reduced sample size, and that would function better as typology descriptors. Table 16 shows how each of the typologies performed on the profiling variables: environmental worldviews, climate-centric, animal exploitation, animal extinction, role of government, and the role of technology. Effect size was determined by η2.

Table 16: Typologies and their performance on environmental worldviews and environmental issues and attitudes profiling variables

Typology	Dis	Obs	Mis	Her	Exp	Hed	MEAN	ANOVA	η^2
Environmental worldviews	3.21	3.70	3.74	3.54	4.11	3.39	3.70	F(5,714) = 44.86*	.24
Climate-centric	3.73	3.92	3.49	4.25	4.15	2.50	3.75	F(5,721) = 60.74*	.30
Animal exploitation	3.21	3.66	3.40	3.81	4.26	2.75	3.61	F(5,667) = 41.73*	.24
Animal extinction	3.42	4.25	4.01	4.19	4.65	3.18	4.06	F(5,667) = 46.94*	.26
Role of government	3.73	3.36	3.35	3.83	3.22	3.41	3.42	F(5,721) = 7.713*	.05
Role of technology	3.39	2.48	2.72	3.25	2.36	2.86	2.75	F(5,721) = 34.478*	.19

Scale = 1–5

*p<.0001

Figure 6 is a line graph aimed at showing visually how the typologies trend across environmental worldviews, climate-centric, animal exploitation, animal extinction, role of government and role of technology.

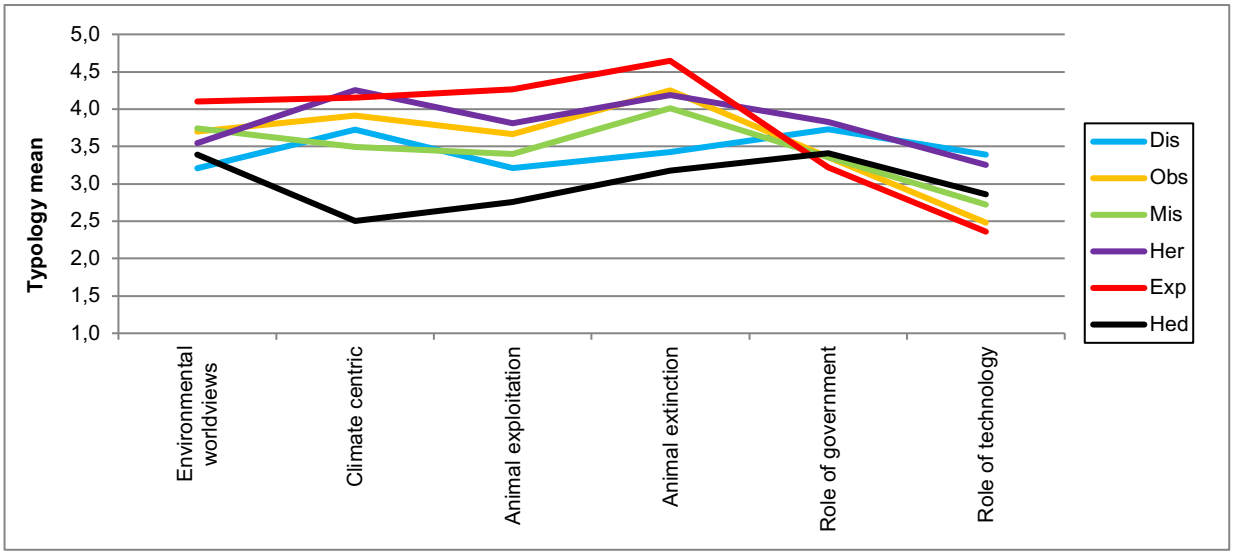


Figure 6: Typology similarity and differences on profiling variables

Table 17 shows significant differences between typologies. Green dots indicate statistically significant differences whereas the red dots show non-significant differences between typologies. To correct for Type 1 error the Benjamini-Hochberg procedure was used.

Table 17: Significant differences between Typologies on profiling variables

	Dis vs Obs	Dis vs Mis	Dis vs Her	Dis vs Exp	Dis vs Hed	Obs vs Mis	Obs vs Her	Obs vs Exp	Obs vs Hed	Mis vs Her	Mis vs Exp	Mis vs Hed	Her vs Exp	Her vs Hed	Exp vs Hed
Environ-mental world-views	🟢	🟢	🟢	🟢	🔴	🔴	🔴	🟢	🟢	🟢	🟢	🟢	🟢	🔴	🟢
Climate-centric	🔴	🔴	🟢	🟢	🟢	🟢	🟢	🔴	🟢	🟢	🟢	🟢	🔴	🟢	🟢
Animal exploit-ation	🟢	🔴	🟢	🟢	🟢	🔴	🔴	🟢	🟢	🟢	🟢	🟢	🟢	🟢	🟢
Animal extinct-ion	🟢	🟢	🟢	🟢	🔴	🔴	🔴	🟢	🟢	🔴	🟢	🟢	🟢	🟢	🟢
Role of govern-ment	🔴	🔴	🔴	🟢	🔴	🔴	🟢	🔴	🔴	🟢	🔴	🔴	🟢	🟢	🔴
Role of techn-ology	🟢	🟢	🔴	🟢	🟢	🔴	🟢	🔴	🟢	🟢	🟢	🔴	🟢	🟢	🟢

- Statistically significant
- Non-significant

Environmental worldviews was treated as a cognitive construct and was expressed on a range from an environmental paradigm (EP) to a dominant social paradigm (DSP) (see Dunlap, Van Liere, Mertig, & Jones, 2000; Kilbourne & Polonsky, 2005). The overall ANOVA was significant: $F(5.714) = 44.86$; $p<0.0001$. Post-hoc tests showed that the mean score differed significantly between all typologies except between the *Disconnected* and the *Hedonist*, the *Observer* and the *Misunderstood*, the *Observer* and the *Hero*, and the *Hero* and the *Hedonist*. The effect sizes were moderate to large except for between the *Observer* and the *Explorer*, which was small. The *Explorer* ($\overline{x} = 4.11$) had an EP, and this supports other results for this typology. The *Disconnected* ($\overline{x} = 3.21$) sat on the DSP end of the spectrum that is negatively related to environmental attitudes, as it is a worldview that perceives that nature is for human exploitation (see Price, Walker, & Boschetti, 2014). The *Hero* ($\overline{x} = 3.54$) did not show a strong EP which contradicts their connectedness to nature score. The *Hero* worldview suggests that a biophilic affiliation does not necessarily correspond to an environmental worldview.

Climate centric included concerns about climate change, rising sea levels, global warming, natural disasters, and ozone depletion. The overall ANOVA was significant: $F(5.715) = 60.74$; $p<0.0001$. Post-hoc tests showed that the mean score differed significantly between all typologies except between the *Disconnected* and the *Observer*, the *Disconnected* and the *Misunderstood*, the *Observer* and the *Explorer*, and the *Hero* and the *Explorer*. The effect sizes were moderate to large except for the *Observer* and the *Explorer*, which was small. The *Hero* ($\overline{x} = 4.25$) was the most concerned about large scale environmental issues whereas the *Hedonist* ($\overline{x} = 2.50$) was the least concerned. This suggests that the *Hero* is people-centric and therefore shows concern about the impact climate centric issues will have on society.

Animal exploitation (N = 673) included concerns about animals used in entertainment, the legal rights of animals, domestic breeding, wild breeding, factory farming, domestic animal welfare, animals used in testing, and animals used in consumer products. A study by Faver (2013) found higher concern for animal welfare was related to belief in the fragility of nature's balance, belief in the possibility of an ecological crisis, and anti-anthropocentrism (as measured by the NEP) and can be used as a guideline for interpretation. Therefore, one could expect that a lower NEP score would lead to a lower concern for animal exploitation. The overall ANOVA was significant: $F(5.667) = 41.73$; $p<0.0001$. Post-hoc tests showed that the mean score differed significantly between all typologies except between the *Disconnected* and the *Misunderstood*, the *Observer* and the *Misunderstood*, and the *Observer* and the *Hero*. The effect sizes were moderate to large. The *Explorer* ($\overline{x} = 4.26$) expressed the most concern compared to the *Hedonist* ($\overline{x} = 2.75$) who expressed the least. This finding suggests firstly that there is some correlation between environmental worldviews and concern for animal welfare (see Faver, 2013) and that animal related issues could be subjectively linked to environmental issues.

Animal extinction (N=673) included concerns about canned lion hunting, deforestation, overfishing, whale hunting, dolphin capture, cruelty, poaching, and trophy hunting. The overall ANOVA was

significant: F(5.667) = 46.94; p<0.0001. Post-hoc tests showed that the mean score differed significantly between all typologies except between the *Disconnected* and the *Hedonist*, the *Observer* and the *Misunderstood*, the *Observer* and the *Hero*, and the *Misunderstood* and the *Hero*. The effect sizes were moderate to large. The *Explorer* ($\bar{x}$ = 4.65) was the most concerned and the *Hedonist* ($\bar{x}$ = 3.18) was the least concerned.

The role of the government included the belief that the wellbeing of the environment, domestic animals, farm animals, and wild animals are the government's responsibility. The overall ANOVA was significant: F(5.715) = 7.713; p<0.0001. Post-hoc tests showed that the mean score differed significantly between the *Disconnected* and the *Explorer*, the *Observer* and the *Hero*, the *Misunderstood* and the *Hero*, the *Hero* and the *Explorer*, and the *Hero* and the *Hedonist*. The effect sizes were moderate. The *Hero* ($\bar{x}$ = 3.83) held this belief the most strongly indicating a diffusion of responsibility and perhaps a weak locus of control, whereas the *Explorer* ($\bar{x}$ = 3.22) felt differently.

The role of technology included the belief that the environment, domestic animals, farm animals, and wild animals will be saved through technological progress. The overall ANOVA was significant: F(5.715) = 34.478; p<0.0001. Post-hoc tests showed that the mean score differed significantly between all typologies except between the *Disconnected* and the *Hero*, the *Observer* and the *Misunderstood*, the *Observer* and the *Explorer*, and the *Misunderstood* and the *Hedonist*. The effect sizes were moderate to large. This belief was held the most strongly by the *Disconnected* ($\bar{x}$ = 3.39) and the least by the *Explorer* ($\bar{x}$ = 2.36).

4.5.1 Typology behaviour

Typologies might look different, but behavioural trends were similar. This incongruence is due to the attitude-behaviour gap that suggests that the relationship between attitudes and behaviour cannot be understood linearly. Pro-environmental consciousness is a more useful construct as it suggests a complex interplay between environmental knowledge, values, attitudes, and emotional involvement that impacts on behaviour (see Kollmuss & Ayeman, 2002). Attitudinal variables and values alone are not sufficient to explain environmental behaviour (see Poortinga, Steg, & Vlek, 2004). It is crucial to ascertain claimed typological behaviour to obtain insight and feed that into the understanding of the system dynamics. Table 18 shows how each of the typologies performed on the behavioural variables: recycle, reduce, conscious consumption, environmentally friendly travel, charitable, environmentally conscious travel, water reduction, re-use and smart gardening. Effect size was determined by η2.

Table 18: Typologies and their performance on environmental behaviours

Typology	Dis	Obs	Mis	Her	Exp	Hed	MEAN	ANOVA	η^2
Recycle	2.59	2.64	2.66	3.08	3.28	2.11	2.81	F(5,714) = 17.71*	.11
Reduce	4.03	4.18	4.18	4.50	4.47	3.72	4.24	F(5,714) = 21.44*	.13

Conscious consumption	3.01	3.11	3.12	3.51	3.67	2.56	3.25	F(5,714) = 32.46*	.19
Environmentally friendly travel	2.96	2.62	2.62	3.27	2.73	2.27	2.74	F(5,714) = 9.79*	.06
Charitable	1.91	1.86	1.92	2.27	2.53	1.75	2.09	F(5,714) = 11.79*	.08
Environmentally conscious travel	3.14	3.37	3.35	3.68	3.90	2.98	3.47	F(5,714) = 14.23*	.09
Water reduction	3.98	4.31	4.25	4.29	4.49	3.80	4.24	F(5,714) = 10.82*	.07
Re-use	3.44	3.70	3.62	3.97	3.97	3.21	3.70	F(5,714) = 10.01*	.07
Smart gardening	3.00	2.69	2.71	3.19	3.20	2.31	2.89	F(5,714) = 10.58*	.07

Scale = 1–5

*p<.0001

Figure 7 is a line graph aimed at showing visually how the typologies trend across recycle, energy reduction, conscious consumption, environmentally friendly travel, charitable, environmentally conscious travel, water reduction, reuse and smart gardening.

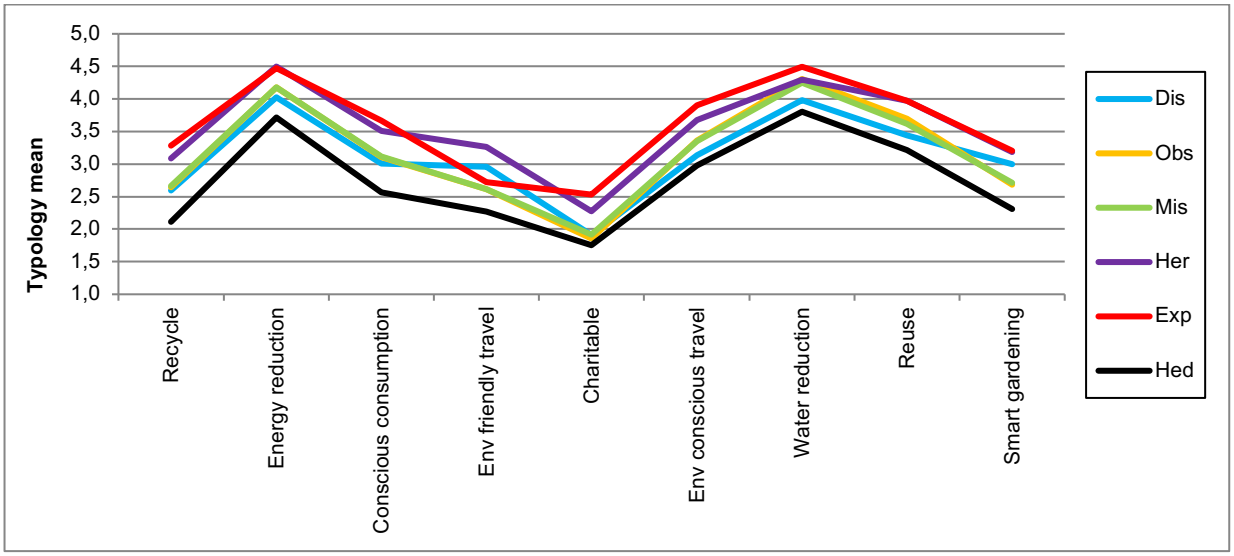


Figure 7: Typology similarity and differences on behaviour

Table 19 shows the significant differences between typologies. Green dots indicate statistically significant differences whereas the red dots show non-significant differences between typologies. To correct for Type 1 error the Benjamini-Hochberg procedure was used.

Table 19: Significant differences between typologies on behaviour

N=720	Dis vs Obs	Dis vs Mis	Dis vs Her	Dis vs Exp	Dis vs Hed	Obs vs Mis	Obs vs Her	Obs vs Exp	Obs vs Hed	Mis vs Her	Mis vs Exp	Mis vs Hed	Her vs Exp	Her vs Hed	Exp vs Hed
Recycle	🔴	🔴	🟢	🟢	🔴	🔴	🟢	🟢	🟢	🟢	🟢	🟢	🔴	🟢	🟢
Reduce	🔴	🔴	🟢	🟢	🟢	🔴	🟢	🟢	🟢	🟢	🟢	🟢	🔴	🟢	🟢
Conscious consumption	🔴	🔴	🟢	🟢	🟢	🔴	🟢	🟢	🟢	🟢	🟢	🟢	🔴	🟢	🟢
Environmentally friendly travel	🔴	🔴	🔴	🔴	🟢	🔴	🟢	🔴	🔴	🟢	🔴	🔴	🟢	🟢	🔴
Charitable	🔴	🔴	🔴	🟢	🔴	🔴	🟢	🟢	🔴	🔴	🟢	🔴	🔴	🟢	🔴
Environmentally conscious travel	🔴	🔴	🟢	🟢	🔴	🔴	🔴	🟢	🔴	🔴	🟢	🔴	🔴	🟢	🟢
Water reduction	🔴	🔴	🔴	🟢	🔴	🔴	🔴	🔴	🟢	🔴	🟢	🟢	🔴	🟢	🟢
Re-use	🔴	🔴	🟢	🟢	🔴	🔴	🔴	🔴	🟢	🔴	🟢	🔴	🔴	🟢	🟢
Smart gardening	🔴	🔴	🔴	🔴	🟢	🔴	🟢	🟢	🔴	🟢	🟢	🔴	🔴	🟢	🟢

🟢 Statistically significant

🔴 Non-significant

When it comes to behaviour, only 10.8% of people in urban areas recycle (see Statistics South Africa [Stats SA], 2018a). For recycling behaviour the overall ANOVA was significant: $F(5.714) = 17.706$; $p<0.0001$. Post-hoc tests showed that the mean score differed significantly between all typologies except between the *Disconnected* and the *Observer*, the *Disconnected* and the *Misunderstood*, the *Disconnected* and the *Hedonist* (marginal), the *Observer* and the *Misunderstood*, and the *Hero* and the *Explorer*. The effect sizes were small to moderate except for the *Hero* and the *Hedonist*, and the *Explorer* and the *Hedonist*, which were large. The *Explorer* ($\bar{x} = 3.28$) scored the highest and the *Hedonist* the lowest ($\bar{x} = 2.11$) on recycling behaviour. A lack of recycling can often be a consequence of logistical limitations (see Stats SA, 2018a) or apathy.

South Africa has been highly energy intensive in the past and that needs to be addressed with new development paths in order to transition to a low-carbon economy (see Winkler & Marquand, 2009). For the energy reduction behaviour the overall ANOVA was significant: $F(5.714) = 21,44$; $p<0.0001$. Post-hoc tests showed that the mean score differed significantly between all typologies except between the *Disconnected* and the *Observer*, the *Disconnected* and the *Misunderstood*, the *Observer* and the *Misunderstood*, and the *Hero* and the *Explorer*. The effect sizes were moderate to large except for the *Disconnected* and the *Hedonist* which was small. The *Hero* scored the highest ($\bar{x} = 4.50$) and the *Hedonist* the lowest ($\bar{x} = 3.72$) on this behaviour. In comparison, a study on South African households asked how they would deal with a sudden increase in the cost of electricity and 36.4% said that they

would continue using the same amount, 63.8% would look for alternative sources, and 5.9% would stop paying for their electricity usage. Nationally, 82.2% would reduce their usage (see Stats SA, 2018b) showing that a cost-related strategy might not impact all typologies.

South African consumption habits since 1994 have shifted to more animal-sourced foods and less vegetables according to a study conducted by Ronquest-Ross, Vink and Sigge (2015), with green purchasing being influenced by environmental awareness, price, and social groups (see Anvar & Venter, 2014). For conscious consumption behaviour the overall ANOVA was significant: $F(5.714) = 32.46$; $p<0.0001$. Post-hoc tests showed that the mean score differed significantly between all typologies except between the *Disconnected* and the *Observer*, the *Disconnected* and the *Misunderstood*, the *Observer* and the *Misunderstood*, and the *Hero* and the *Explorer*. The effect sizes were moderate to large. The *Explorer* scored the highest ($\overline{x} = 3.67$) and the *Hedonist* the lowest ($\overline{x} = 2.56$) on conscious consumption.

Environmentally friendly travel behaviour included using public transport, recycled tyres, or walking/cycling. Contextually, taxis are used by 51% of households in South Africa, 18.1% use busses and 7.6% use trains (see Stats SA, 2015). For environmentally friendly travel the overall ANOVA was significant: $F(5.714) = 9.786$; $p<0.0001$. Post-hoc tests showed that the mean score differed significantly between the *Disconnected* and the *Hedonist*, the *Observer* and the *Hero*, the *Misunderstood* and the *Hero*, the *Hero* and the *Explorer*, and the *Hero* and the *Hedonist*. The effect sizes were moderate to large. The *Hero* scored the highest ($\overline{x} = 3.27$) and the *Hedonist* the lowest ($\overline{x} = 2.27$) on environmentally friendly travel behaviour.

People tend to get involved in charity work because it aligns with their altruistic values, increases their knowledge, impacts on self-esteem, gives them experience to enhance their career, or provides a sense of belonging (see Zappalà, 2000). For charitable behaviour the overall ANOVA was significant: $F(5.714) = 11.794$; $p<0.0001$. Post-hoc tests showed that the mean score differed significantly between the *Disconnected* and the *Explorer*, the *Observer* and the *Hero*, the *Observer* and the *Explorer*, the *Misunderstood* and the *Explorer*, and the *Hero* and the *Hedonist*. The effect sizes were moderate. The *Explorer* scored the highest ($\overline{x} = 2.53$) and the *Hedonist* scored the lowest ($\overline{x} = 1.75$) on charitable behaviour.

Environmentally conscious travel behaviour included reducing air travel, fuel consumption, or adapting driving style. The overall ANOVA was significant: $F(5.714) = 14.229$; $p<0.0001$. Post-hoc tests showed that the mean score differed significantly between the *Disconnected* and the *Hero*, the *Disconnected* and the *Explorer*, the *Observer* and the *Explorer*, the *Misunderstood* and the *Explorer*, the *Hero* and the *Hedonist*, the *Explorer* and the *Hedonist*. The effect sizes were moderate to large. The *Explorer* scored the highest ($\overline{x} = 3.90$) and the *Hedonist* the lowest ($\overline{x} = 2.98$) on environmentally conscious travel behaviour.

Water reduction behaviour included having fewer baths, shorter showers, and turning taps off. For water reduction behaviour the overall ANOVA was significant: $F(5.714) = 10.82$; $p<0.0001$. Post-hoc tests

showed that the mean score differed significantly between the *Disconnected* and the *Explorer*, the *Observer* and the *Hedonist*, the *Misunderstood* and the *Explorer*, the *Misunderstood* and the *Hedonist*, the *Hero* and the *Hedonist*, and the *Explorer* and the *Hedonist*. The effect sizes were moderate to large. The *Explorer* scored the highest ($\overline{x}$ = 4.49) and the *Hedonist* the lowest ($\overline{x}$ = 3.80) on water reduction behaviour.

Two percent of South Africa's emissions come from waste (see Stats SA, 2018a) and re-using materials is a good way to reduce this. For the reuse behaviour the overall ANOVA was significant: F(5.714) = 10.014; p<0.0001. Post-hoc tests showed that the mean score differed significantly between the *Disconnected* and the *Hero*, the *Disconnected* and the *Explorer*, the *Observer* and the *Hedonist*, the *Misunderstood* and the *Explorer*, the *Hero* and the *Hedonist*, and the *Explorer* and the *Hedonist*. The effect sizes were moderate to large except for the *Misunderstood* and the *Explorer*, which was small. The *Hero* and the *Explorer* scored the highest ($\overline{x}$ = 3.97) and the *Hedonist* the lowest ($\overline{x}$ = 3.21) on reuse behaviour.

Smart gardening behaviour included capturing rainwater, using grey water, and growing one's own fruit and vegetables. For the smart gardening behaviour the overall ANOVA was significant: F(5.714) = 10.575; p<0.0001. Post-hoc tests showed that the mean score differed significantly between the *Disconnected* and the *Hedonist*, the *Observer* and the *Hero*, the *Observer* and the *Explorer*, the *Misunderstood* and the *Hero*, the *Misunderstood* and the *Explorer*, the *Hero* and the *Hedonist*, and the *Explorer* and the *Hedonist*. The effect sizes were small to moderate except for the *Explorer* and the *Hedonist*, which was large. The *Explorer* scored the highest ($\overline{x}$ = 3.20) and the *Hedonist* the lowest ($\overline{x}$ = 2.31) on smart gardening behaviour.

4.5.2 Typology values

Altruistic and biospheric value orientations are linked to internal motivations whereas egoistic values are linked to external motivations (see De Groot & Steg, 2010) in social systems. Values can either be in conflict or congruence and should be treated as a system that ranges from self-enhancement to self-transcendence as well as from openness to change to conservation (see Schwartz, 2009). Understanding values that form part of each of the typological systems is essential as values provide an explanation of motivational processes that influence how the social system operates. The following section aims to show how each of the typologies performed on universal values (SVS): conformity, tradition, benevolence, universalism, self-direction, stimulation, hedonism, achievement, power and security.

Table 20 shows how each of the typologies performed on the values: conformity, tradition, benevolence, universalism, self-direction, stimulation, hedonism, achievement, power and security. Effect size was determined by η2.

Table 20: Typologies and their performance on values

Typology	Dis	Obs	Mis	Her	Exp	Hed	MEAN	ANOVA	η^2
Conformity	0.48	0.53	0.39	0.70	0.34	0.37	0.45	F(5,648) = 2.46	.02
Tradition	-0.66	-0.90	-1.14	-0.44	-1.19	-0.83	-0.94	F(5,648) = 7.90 **	.06
Benevolence	0.41	0.62	0.56	0.60	0.71	0.39	0.58	F(5,648) = 2.78*	.02
Universalism	0.05	0.52	0.59	0.37	1.02	0.02	0.54	F(5,648) = 37.97 **	.23
Self-direction	0.45	0.45	0.48	0.31	0.65	0.51	0.49	F(5,648) = 2.48	.02
Stimulation	-0.72	-1.08	-0.81	-0.87	-0.80	-0.69	-0.84	F(5,648) = 1.50	.01
Hedonism	-0.57	-0.93	-0.68	-0.86	-1.12	-0.20	-0.79	F(5,648) = 7.89 **	.06
Achievement	0.45	0.31	0.27	0.37	-0.12	0.32	0.22	F(5,648) = 7.48 **	.05
Power	-1.07	-1.64	-1.61	-1.59	-2.08	-1.12	-1.61	F(5,648) = 18.47 **	.12
Security	0.20	0.12	0.04	-0.02	0.04	0.11	0.07	F(5,648) = 0.78	.01

Scale = 1–7

* p<.05

** p<.0001

Figure 8 is a line graph aimed at showing visually how the typologies trend across conformity, tradition, benevolence, universalism, self-direction, stimulation, hedonism, achievement, power and security.

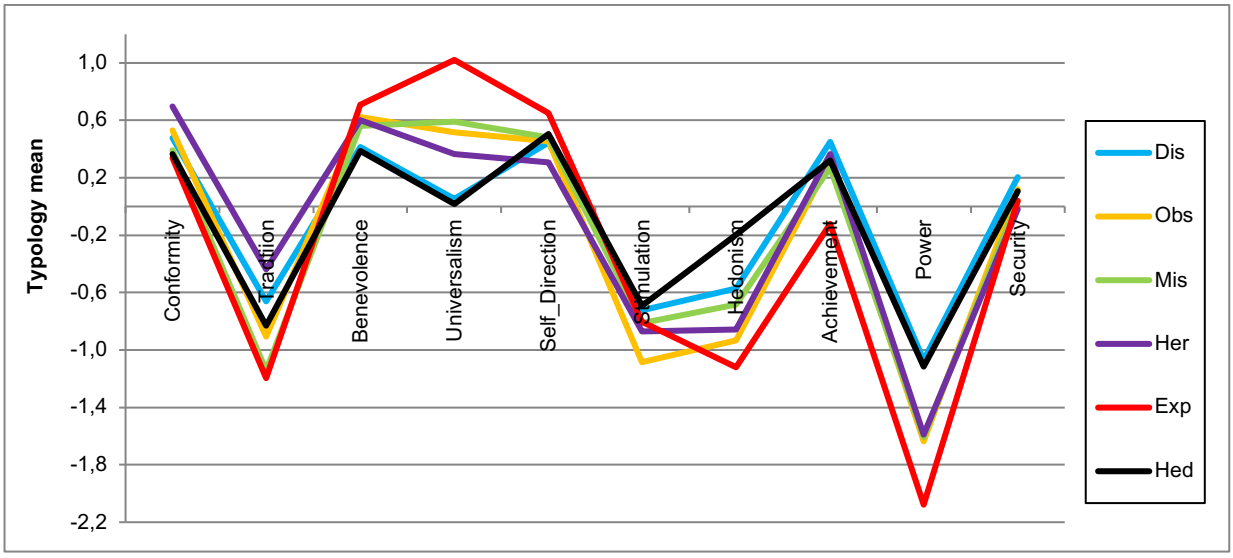


Figure 8: Typology similarity and differences on values

Table 21 shows significant differences between typologies. Green dots indicate statistically significant differences whereas the red dots show non-significant differences between typologies. To correct for Type 1 error the Benjamini-Hochberg procedure was used.

Table 21: Significant differences between typologies on values

N=654	Dis vs Obs	Dis vs Mis	Dis vs Her	Dis vs Exp	Dis vs Hed	Obs vs Mis	Obs vs Her	Obs vs Exp	Obs vs Hed	Mis vs Her	Mis vs Exp	Mis vs Hed	Her vs Exp	Her vs Hed	Exp vs Hed
Conformity	🔴	🔴	🔴	🔴	🔴	🔴	🔴	🔴	🔴	🔴	🔴	🔴	🔴	🔴	🔴
Tradition	🔴	🔴	🔴	🟢	🔴	🔴	🟢	🔴	🔴	🟢	🔴	🔴	🟢	🔴	🔴
Benevolence	🔴	🔴	🔴	🔴	🔴	🔴	🔴	🔴	🔴	🔴	🔴	🔴	🔴	🔴	🔴
Universalism	🟢	🟢	🔴	🟢	🔴	🔴	🔴	🟢	🟢	🔴	🟢	🟢	🟢	🟢	🟢
Self-direction	🔴	🔴	🔴	🔴	🔴	🔴	🔴	🔴	🔴	🔴	🔴	🔴	🔴	🔴	🔴
Stimulation	🔴	🔴	🔴	🔴	🔴	🔴	🔴	🔴	🔴	🔴	🔴	🔴	🔴	🔴	🔴
Hedonism	🔴	🔴	🔴	🔴	🔴	🔴	🔴	🔴	🟢	🔴	🟢	🔴	🔴	🟢	🟢
Achievement	🔴	🔴	🔴	🟢	🔴	🔴	🔴	🟢	🔴	🔴	🟢	🔴	🟢	🔴	🟢
Power	🟢	🟢	🟢	🟢	🔴	🔴	🔴	🟢	🟢	🔴	🟢	🟢	🟢	🟢	🟢
Security	🔴	🔴	🔴	🔴	🔴	🔴	🔴	🔴	🔴	🔴	🔴	🔴	🔴	🔴	🔴

🟢 Statistically significant

🔴 Non-significant

Conformity values included control over actions and impulses that might offend or harm others and is a value that aligns with social norms (see Schwartz, 2012). For conformity the overall ANOVA showed no significant differences between typologies. The lack of significant difference between typologies does not mean that the sample overall is typically conformist as there are differences in the score of each typology. The *Hero* scored the highest ($\bar{x}$ = 0.70) and the *Explorer* the lowest ($\bar{x}$ = 0.34) on conformity values.

Tradition is a value that aligns with cultural and religious beliefs and customs (see Schwartz, 2012). For tradition the overall ANOVA was significant: $F(5.648) = 7.9013$; $p<0.0001$. Post-hoc tests showed that the mean score differed significantly between the *Disconnected* and the *Explorer*, the *Observer* and the *Hero*, the *Misunderstood* and the *Hero*, and the *Hero* and the *Explorer*. The effect sizes were small to moderate. The *Disconnected* ($\bar{x}$ = -0.66) scored the highest and the *Explorer* ($\bar{x}$ = -1.19) the lowest on this value. It suggests that culture and tradition might play an important role in how the *Disconnected* views animals and nature, and is aligned with the strong religious beliefs held by this typology.

Benevolence included valuing constructive relationships that increase the wellbeing of the in-group (see Schwartz, 2012). Benevolence links to internal motivations for behaviour but it contrasts with conformist values that value cooperation in order to avoid negative outcomes (see Schwartz, 2012), and therefore function on external motivations. For benevolence, the overall ANOVA was significant: $F(5.648) = 2.7789$; $p<0.017$. Post-hoc tests, however, showed no significant differences between typologies. This is probably due to the different group sizes and corrections for Type 1 error in the post-hoc tests. The *Explorer* scored the highest ($\bar{x}$ = 0.71) and the *Hedonist* the lowest ($\bar{x}$ = 0.39) on the value of benevolence.

Universalism is an extension of benevolence and included tolerance, appreciation, and protection of all people and nature (see Schwartz, 2012). For universalism the overall ANOVA was significant: $F(5.648) = 37.9661$; $p<0.0001$. Post-hoc tests showed that the mean score differed significantly between all typologies except between the *Disconnected* and the *Hero*, the *Disconnected* and the *Hedonist*, the *Observer* and the *Misunderstood*, the *Observer* and the *Hero*, and the *Misunderstood* and the *Hero*. The effect sizes were moderate to large. The *Explorer* ($\overline{x} = 1.02$) scored the highest and the *Hedonist* ($\overline{x} = 0.02$) the lowest. The low score on universalism suggests that the *Hedonist* is focused on selfish interests rather than the enhancement of others.

Self-direction measured independence and freedom (see Schwartz, 2012). For self-direction the overall ANOVA showed no significant differences between typologies. The *Explorer* scored the highest ($\overline{x} = 0.65$) and the *Hero* scored the lowest ($\overline{x} = 0.31$) on the value of self-direction.

Stimulation is the need for excitement and new daring experiences in life (see Schwartz, 2012). For stimulation the overall ANOVA was not significant: $F(5.648) = 1.5029$; $p<0.19$. The *Hedonist* scored the highest ($\overline{x} = -0.69$) and the *Observer* the lowest ($\overline{x} = -1.08$) on the value of stimulation.

Hedonism measured self-gratification and pleasure (see Schwartz, 2012). For hedonism the overall ANOVA was significant: $F(5.648) = 7.8855$; $p<0.0001$. Post-hoc tests showed that the mean score differed significantly between the *Observer* and the *Hedonist*, the *Misunderstood* and the *Explorer*, the *Hero* and the *Hedonist*, and the *Explorer* and the *Hedonist*. The effect sizes were small to moderate. The *Explorer* ($\overline{x} = -1.12$) scored the lowest whereas the *Hedonist* the highest ($\overline{x} = -0.20$) indicating that they have a strong desire for positive states of arousal (see Schwartz, 2012).

Achievement included valuing success as determined by society leading to social approval (see Schwartz, 2012). For achievement the overall ANOVA was significant: $F(5.648) = 7.48363$; $p<0.0001$. Post-hoc tests showed that the mean score differed significantly between the *Explorer* versus every other typology. The effect sizes were small to moderate. The *Explorer* ($\overline{x} = -0.12$) was more focused on internal motivations and self-transcendent values and therefore this contrasts with achievement values. The *Disconnected* scored the highest ($\overline{x} = 0.45$) indicating their need to receive social approval and recognition as well as a focus on generating resources for perceived survival.

Power included the need for social status, control, and dominance over people and resources (see Schwartz, 2012). For power the overall ANOVA was significant: $F(5.648) = 18.473$; $p<0.0001$. Post-hoc tests showed that the mean score differed significantly between all typologies except between the *Disconnected* and the *Hedonist*, the *Observer* and the *Misunderstood*, the *Observer* and 4, and the *Misunderstood* and the *Hero*. The effect sizes were moderate to large. The *Explorer* scored the lowest ($\overline{x} = -2.08$) and the *Disconnected* the highest ($\overline{x} = -1.07$). This suggests that the *Disconnected* are in search of self-esteem and that they have a focus on self-enhancement that relates negatively to environmental concern (see Schultz et al., 2005). Subsequently, their lack of concern in turn relates to

their increased apathetic attitudes and possibly links to their strong anthropocentric religious beliefs when it comes to the biosphere.

The goal of security values is safety for society, others and self and therefore could be focused on individual interests or wider group interests (see Schwartz, 2012). For security the overall ANOVA was not significant: F(5.648) = 0.779709; p<0.56. The *Disconnected* scored the highest ($\bar{x}$ = 0.20) and the *Hero* the lowest ($\bar{x}$ = -0.02) on the value of security.

4.5.3 Typologies and personality

Personality impacts environmental concern. A study by Hirsch (2010) found those with agreeable and open personality traits were more concerned about the environment. Table 22 shows how each of the typologies performed on personality: Extraversion-Introversion, Sensing-Intuiting, Thinking-Feeling, and Judging-Perceiving. Effect size was determined by η2.

Table 22: Typologies and their performance on personality

Typology	Dis	Obs	Mis	Her	Exp	Hed	MEAN	ANOVA	η^2
Extraversion – Introversion	5.17	5.96	6.34	5.05	6.02	5.95	5.83	F(5,613) = 6.95 **	.05
Sensing – Intuiting	6.08	6.32	6.35	6.23	6.95	5.88	6.41	F(5,613) = 7.64 **	.06
Thinking – Feeling	6.42	6.79	6.59	6.48	7.26	6.39	6.74	F(5,613) = 7.66**	.06
Judging – Perceiving	4.49	4.34	4.37	3.75	4.26	4.84	4.31	F(5,613) = 3.93 *	.03

Scale = 1–10

*p<.01

**p<.0001

Figure 9 is a sideways line graph aimed at showing how the typologies trend dimensionally on extraversion - introversion, sensing - intuition, thinking - feeling and judging - perceiving.

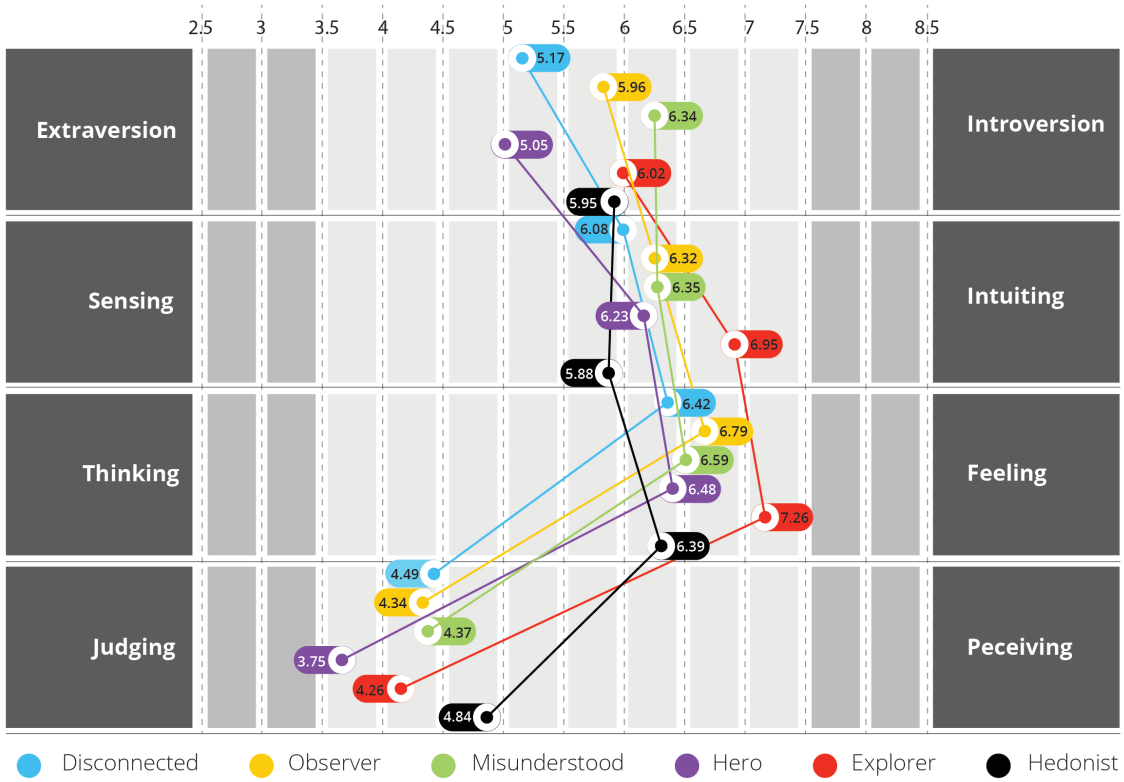


Figure 9: Typology similarity and differences on personality dimensions

Table 23 shows significant differences between typologies. Green dots indicate statistically significant differences whereas the red dots show non-significant differences between typologies. To correct for Type 1 error the Benjamini-Hochberg procedure was used.

Table 23: Significant differences between typologies on personality

N=619	Dis vs Obs	Dis vs Mis	Dis vs Her	Dis vs Exp	Dis vs Hed	Obs vs Mis	Obs vs Her	Obs vs Exp	Obs vs Hed	Mis vs Her	Mis vs Exp	Mis vs Hed	Her vs Exp	Her vs Hed	Exp vs Hed
Extraversion – Introversion	🔴	🟢	🔴	🔴	🔴	🔴	🟢	🔴	🔴	🟢	🔴	🔴	🟢	🔴	🔴
Sensing – Intuiting	🔴	🔴	🔴	🟢	🔴	🔴	🔴	🟢	🔴	🔴	🟢	🔴	🟢	🔴	🟢
Thinking – Feeling	🔴	🔴	🔴	🟢	🔴	🔴	🔴	🟢	🔴	🔴	🟢	🔴	🟢	🔴	🟢
Judging – Perceiving	🔴	🔴	🔴	🔴	🔴	🔴	🔴	🔴	🔴	🔴	🔴	🔴	🔴	🟢	🔴

🟢 Statistically significant

🔴 Non-significant

Extraversion is an orientation towards the external world where the extravert trusts information from the outside world and is motivated to influence the outside world, has a collective nature, and strong altruism (see Sharp, 1987). The introverted type is more focused on personal factors and oriented towards their inner reality (see Sharp, 1987). For extraversion-introversion the overall ANOVA was significant: $F(5.613) = 6.953$; $p<0.0001$. Post-hoc tests showed that the mean score differed significantly between

the *Disconnected* and the *Misunderstood*, the *Observer* and the *Hero*, the *Misunderstood* and the *Hero*, and the *Hero* and the *Explorer*. The effect sizes were moderate. The *Misunderstood* was closest Introversion ($\bar{x}$ = 6.34) and the *Hero* was closest to Extraversion ($\bar{x}$ = 5.05).

Sensing focused on what information is currently available to make a decision (see Sharp, 1987) and intuiting goes beyond information provided by the senses (see Psytech, 1998). For sensing-intuiting the overall ANOVA was significant: $F(5.613) = 7.64$; $p<0.0001$. Post-hoc tests showed that the mean score differed significantly between the *Explorer* and all other typologies. The effect sizes were small to moderate. Therefore the *Explorer* was the most intuitive ($\bar{x}$ = 6.95) indicating that they have the ability to explore more broadly the meaning and theory that might influence their experience (Psytech, 1998). This is in contrast to the *Hedonist* who scored the highest on Sensing ($\bar{x}$ = 5.88).

The thinking personality is rational and analytical whereas the feeling type attaches emotional value to objects or events (see Psytech, 1998). For thinking-feeling the overall ANOVA was significant: $F(5.613) = 7.66$; $p<0.0001$. Post-hoc tests showed that the mean score differed significantly between the *Explorer* and all other typologies except for the *Observer*. The effect sizes were small to moderate. The *Explorer* ($\bar{x}$ = 7.26) was more open to affective relationships that might not be driven by rational thought or processes. This is in contrast to the *Hedonist* who scored highest on Thinking ($\bar{x}$ = 6.39).

Judging and perceiving are secondary processes. The judging type likes to be organised and plans in advance, whereas the perceiving type is more flexible (see Psytech, 1998). For the Judging-Perceiving the overall ANOVA was significant: $F(5.613) = 3.925$; $p<0.0016$. Post-hoc tests showed that the mean score differed significantly between the *Hero* and the *Hedonist*. The effect size was moderate. The *Hero* ($\bar{x}$ = 3.75) was a judging type and therefore prefers order and regulation of mental events whereas the *Hedonist* ($\bar{x}$ = 4.84) might be more impulsive in the way they make decisions.

4.6 Understanding lenses

Issues that people find important create perceptual and experiential boundaries in their world (see Midgley, 1994). A ranking questionnaire aimed to understand these lenses through which typologies filter the world (i.e. environmental, financial, social). Participants ranked the three issues that are of most importance and two that are of least importance to them. The matters were international tensions, economic concerns, political concerns, environmental concerns, social issues, personal safety, religious concerns, and animal rights concerns. The most important issue and least important issue were allocated a relative score of 1.00 based on most summed points with other issues anchored to this ranking using their summed points. Heat maps were used to illustrate the dominant and less dominant lenses for each typology in Table 24 and Table 25.

4.6.1 Important issues

Issues of most and least importance mirrored each other in the overall sample. The most critical issues were personal safety, economic concerns, and social problems (see Bollinger & Stover, 1999; Mkhize, Bennett, Reddy, & Moletsana, 2010; Møller, 2005). Non-human concerns were middle to lower order on

the scale of overall importance. The mirroring effect suggests that when issues have a personal impact, it becomes difficult to focus on issues that are perceived as distant (see Midgley, 1994). For example, the 2005 South Africa Social Attitudes Survey (SASAS) indicated that 49.3% of South Africans felt that economic concerns were more important than those related to the environment (see Struwig, 2010). Some nuances are apparent when it comes to concerns across typologies.

Table 24 shows a heat map indicating the top three issues of concern for each typology. Typologies concerned about survival are unable to focus on issues perceived as more distant. The *Disconnected* showed economic survival concerns whereas typologies 2,3,4,6 showed concerns about physical survival. The *Disconnected* ranked economic concerns as the most important and environmental concerns as the least. On the other hand, the *Explorer* ranked ecological and animal concerns as the most critical and economic concerns as less important. This finding suggests that environmental/animal justice is intricately linked to economic and social justice since the achievement of environmental/animal justice hinges on achieving social justice as seen in, for example, areas where the primary cause of deforestation is poverty (see Faida & Laltaika, 2010). Religious and health concerns emerged as most important for the *Hero* compared to the other typologies and suggests that this typology might have a strong focus on people-centered issues. Animal rights concerns ranked consistently low amongst all typologies except for the *Explorer*. Environmental concerns ranked higher than animal rights concerns across the sample except for the *Hedonist* (but animal rights is the third lowest in terms of importance for them). This would suggest that animal rights campaigners might benefit from using an environmental angle when communicating with all typologies except the *Hedonist*.

Table 24: Heat map of most important issues

Typology	Overall	Dis	Obs	Mis	Her	Exp	Hed
Personal safety	1.000	0.925	1.000	1.000	1.000	0.956	1.000
Economic concerns	0.872	1.000	0.913	0.939	0.876	0.674	0.776
Social issues	0.804	0.753	0.753	0.859	0.894	0.928	0.608
Religious concerns	0.529	0.538	0.613	0.540	0.664	0.403	0.416
Environmental concerns	0.510	0.409	0.400	0.380	0.584	1.000	0.080
Health concerns	0.509	0.602	0.480	0.545	0.628	0.459	0.336
Political concerns	0.363	0.376	0.347	0.305	0.416	0.453	0.200
Animal rights concerns	0.326	0.118	0.187	0.263	0.274	0.707	0.168
International tensions	0.107	0.118	0.107	0.127	0.186	0.055	0.064

4.6.2 Less important issues

Most typologies were unconcerned about religious issues such as sinning, offending, and having a relationship with a higher power. This finding does not necessarily suggest a sample that is becoming less religious as the mean score on a scale of 1-7 (7 being very religious) for the degree of religiosity ranged between 4.6 – 5.1 across typologies. It might suggest a sample in which religion is becoming less important (see Kotzé & Loubser, 2017). According to Arbuckle and Konisky (2015) religious views have an inverse relationship with environmental concern. However, the *Hero* is the most religious typology ($\bar{x}$ = 5.1), yet they have the second highest connectedness to nature score ($\bar{x}$ = 5.25), which

contrasts with their lower environmental worldviews ($\bar{x}$ = 3.54). This suggests that the relationship between religion and environmental concern is complex and that other factors impact the human-nature nexus. The results also suggest that concern for the environment might not be the same as concern for animals (i.e. typologies who worry about the environment might not have the same degree of concern when it comes to animals, as can be seen when looking at the least important issues ranking).

Table 25 shows that animal rights concerns (e.g. sentience of animals, cruelty, laws that protect animals) are less important to typologies than those related to the environment (except for the *Hedonist*). These concerns rank fourth least important in the overall sample (after religious, international tensions, and political matters) with a higher interest only for the *Explorer*. Although there is a lack of South African based research on attitudes towards animals, and some research about conservation, some explanations for this result can be formulated. The most obvious is that the *Disconnected*, *Observer*, *Misunderstood*, *Hero*, and *Hedonist* are slightly more concerned about the environment as they are directly impacted by it when compared to issues related to animals. This result might have looked different if the sample was not primarily urbanised as seen in a rural study conducted around the Imfolozi/Hluhluwe Game Reserve that found households that experience benefits from animal conservation are more supportive of it (see Infield, 1988).

The second plausible explanation is that the fieldwork was conducted when droughts were experienced across South Africa that could have primed the sample to feel that environmental concerns were more pressing and individually impacting at the time. An argument could be made that concerns need to be differentiated between concerns about domestic pets, domestic farm animals, wild animals, and ocean animals (and within this there might be differences in concerns depending on species). These specifics will be presented in Table 27, but at an overall level it should be noted that there is a degree of non-ambient moral disengagement noted, as all typologies show more concern about animal extinctions than animal exploitation (see section 4.10). This complementary finding supports the existence of moral disengagement since individuals cannot be directly responsible for extinctions but might more easily be part of animal exploitation (see Bastian, Loughnan, Haslam, & Radke, 2012; Vining, 2003). Furthermore, factors such as animal attributes, individual experience, and cultural commitment influence attitudes to animals and their welfare (see Serpell, 2004) as well as a degree of empathy (see Taylor & Signal, 2005). Awareness of issues plays some role in understanding behaviour but does not determine it (see Kollmuss & Agyeman, 2002).

Table 25: Heat map of least important issues

Typology	Overall	Dis	Obs	Mis	Her	Exp	Hed
Religious concerns	1.000	0.579	1.000	1.000	1.000	1.000	1.000
International tensions	0.771	0.597	0.878	0.873	0.849	0.660	0.664
Political concerns	0.581	0.920	0.466	0.554	0.828	0.526	0.386
Animal rights concerns	0.492	0.974	0.454	0.490	0.661	0.310	0.498
Environmental concerns	0.386	1.000	0.307	0.309	0.520	0.079	0.645
Health concerns	0.333	0.540	0.282	0.281	0.605	0.286	0.167
Economic concerns	0.276	0.457	0.204	0.195	0.561	0.221	0.271

Personal safety	0.269	0.685	0.175	0.205	0.433	0.200	0.273
Social issues	0.208	0.568	0.152	0.240	0.350	0.117	0.027

4.7 Environmental issues awareness

All typologies showed some degree of increased awareness of environmental challenges. This could be in part due to the more obvious degradation of physical conditions, scarcity of clean drinking water, regular flooding, droughts (fieldwork was conducted during the drought experienced in 2016), health hazards caused by air pollution, and other issues that are impacting people directly (see Conradie, 2003) and/or it could be due to increased media exposure on environmental topics (see Dispensa & Brulle, 2003).

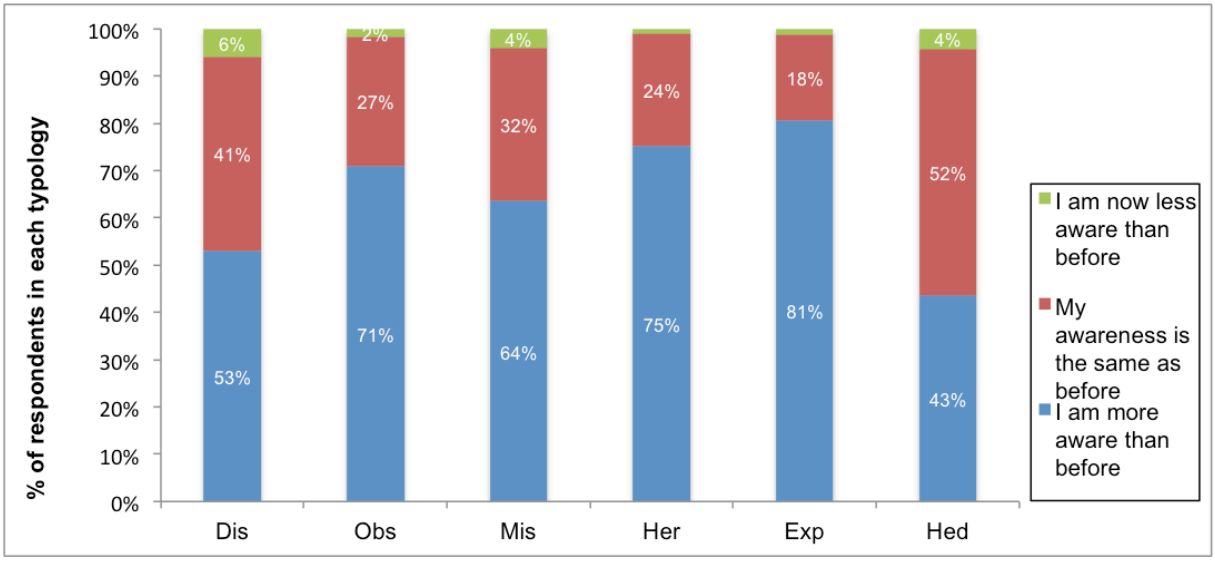


Figure 10: Environmental issues awareness by typology

The bar chart (figure 10) shows a comparison between typologies as well as within-typology regarding levels of awareness of environmental issues. There was a significant relationship between awareness and typology ($p<0.0001$) with the *Explorer* who showed more awareness compared to the *Disconnected* and the *Hedonist* who had a lower proportion of participants who were more aware of environmental issues. This could be due to their non-environmental lens described earlier. This trend was reversed for participants who indicated that they have the same level of awareness of environmental issues. This finding suggests that lenses often influence the type of information typologies seek out and choose to be exposed to, so those who are more concerned about the environment might notice environmental information more. This departs from Milfont (2012) who suggests that increased knowledge/awareness about global warming and climate change would raise concern that would then lead to feeling responsible for helping solve these problems. The willingness to address environmental problems requires the presence of both awareness and an internal locus of control.

4.8. Environmental concerns and control

People can feel concerned about an issue but have no locus of control. Therefore, it is important to ascertain which issues ignite both concern and a feeling of control (see Bostrom, Böhm, & O'Connor, 2013). Looking at the data and focusing specifically on "what I do could have a direct impact" there were significant differences between typologies regarding what they are concerned about, but also what they feel they have control over.

Table 26 shows issues that had the least concern and locus of control in red, and the issues where typologies were more concerned and felt they had more control are marked in green. For air pollution (X^2=30.37; p=0.0007), use of pesticides (X^2=22.88; p=0.011), and biodiversity loss (X^2=32.19; p=0.0004), the *Hero* and the *Explorer* scored significantly higher than the other typologies. For climate change, the *Misunderstood* (X^2=22.44; p=0.013) scored significantly lower than the other typologies. The *Hero* scored significantly higher than the other typologies for ocean acidification (X^2=18.97; p=0.041). With regards to human overpopulation (X^2=22.66; p= 0.012), the *Disconnected*, the *Hero*, and the *Explorer* scored significantly higher than the other typologies. The *Hedonist* scored lower than the other typologies on water pollution (X^2=18.73; p=0.044). On urbanisation, the *Hero* and the *Hedonist* scored higher than the other typologies (X^2=18.88; p=0.042). These findings confirm that for some typologies the non-immediacy of ecological problems, like climate change, is less important (see Kollmuss & Agyeman, 2002). Providing concrete, immediate benefits to people, rather than those abstract in nature, is likely to be more effective in increasing locus of control about these issues of concern (see Swim et al., 2009).

Table 26: Environmental concerns and control

Typology	Dis	Obs	Mis	Her	Exp	Hed
Air pollution	23%	23%	21%	37%	34%	13%
Climate Change	19%	9%	3%	15%	13%	7%
Ocean acidification	8%	5%	7%	16%	9%	11%
Human overpopulation	25%	13%	9%	23%	22%	5%
Water pollution	38%	36%	33%	41%	43%	20%
Urbanisation	18%	9%	12%	22%	12%	21%
Use of pesticides	8%	19%	23%	38%	36%	0%
Biodiversity loss	20%	8%	14%	26%	21%	0%

Least concern and low locus of control – red

Most concern and higher locus of control – green

Figure 11 is a line graph that shows how air pollution, climate change, ocean acidification, human overpopulation, water pollution, urbanization, use of pesticides, and biodiversity loss issues trend across typologies.

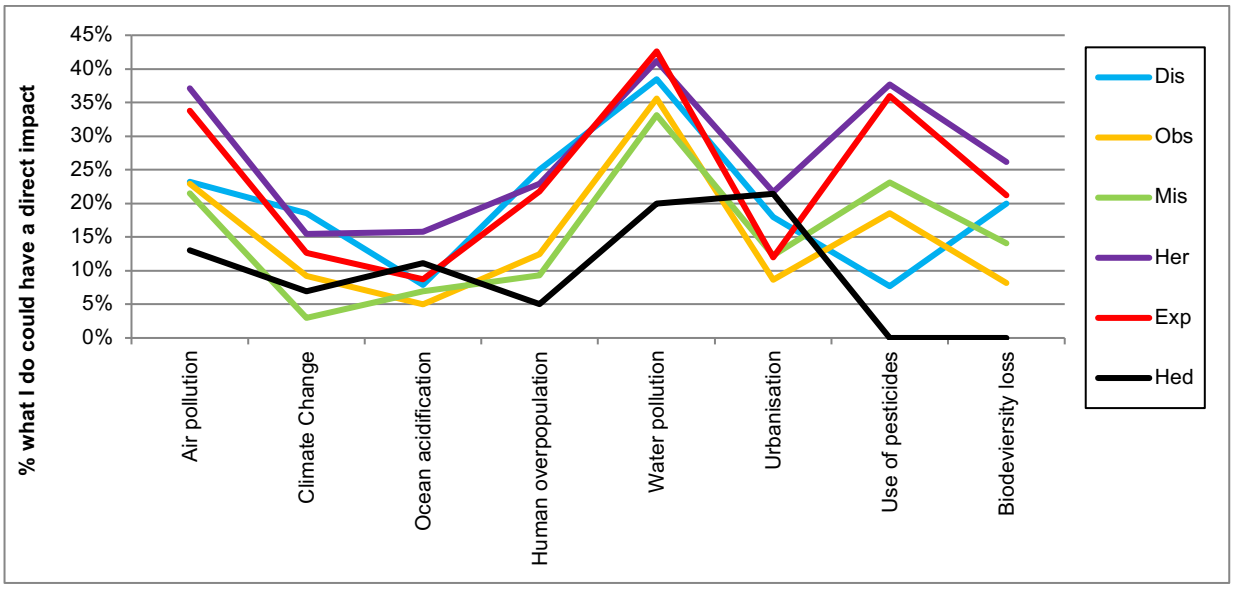


Figure 11: Typological similarity and differences on environmental concern and control

The results, when environmental issues are isolated from other issues, show that water pollution was trending across most typologies. The South African Water Caucus report (2017) raises a concern about South African water security, and the trend indicates that typologies are tapping into this concern since droughts were experienced across South Africa during the fieldwork period. Air pollution and use of pesticides (except for the *Hedonist*) were also trending. Air pollution is a severe problem in South Africa, caused primarily by emissions of sulphur dioxide, particulate matter, nitrogen dioxide, nitrogen oxides, ozone, and benzene that have an impact on the health of the public (see Norman, Cairncross, Witi, & Bradshaw, 2007). Globally, public concern and awareness about pesticides in food and water have increased but are typically thought to be less of an issue in developing countries (see Dunlap, Gallup, & Gallup, 1993). This result compares to Struwig (2010) that showed that polluted air was a considerable concern for South Africans and half of the respondents were also concerned about pesticides or chemicals in farming. Interestingly, Stats SA (2018a) found that households that were concerned about air pollution decreased from 22.8% in 2003 to 19% in 2016. These results would suggest that some typologies are becoming more interested and aware of issues that they feel impact them directly and for others, other more visible issues are a concern.

The trend chart also shows that climate change appeared lower on concern and control for some typologies. This possibly means that although the overall sample showed concern (78.0% are extremely or moderately concerned), they felt they do not have control. The *Observer* (82%), *Hero* (93%), *Explorer* (88%) showed higher levels of concern about climate change, however the reason for the lower trend suggests that although there was a concern, people felt they do not have control over it. Lertzman (2015, p.4) calls this environmental melancholia: *"Environmental melancholia is a condition in which even those who care deeply about the well-being of ecosystems and future generations are paralysed to translate such concern into action."* This lower trend on climate change could also be explained through distance theory where issues that are both psychologically and proximally distant result in reduced degrees of concern and control (see Spence, Poortinga, & Pidgeon, 2012). Distance theory would then suggest that the distance between humans and animals (what happens to animals does not always directly or

consciously impact humans) might be problematic when it comes to concern and control about non-human issues.

4.9. Animal rights awareness

Typologies reported a lower degree of awareness of animal rights compared to those associated with the environment. This finding could be because animals are seen as different from humans so it legitimises a decrease in their value (see Foer, 2009), animal rights concerns remaining stagnant in terms of new developments, ineffective framing of messages (see Bastian, Costello, Loughnan, & Hodson, 2011), overshadowing by broader environmental concerns, withdrawal of moral concern (see Loughnan, Haslam, & Bastian, 2010), denial (see Wicks, 2011), living in a patriarchal society (see Lockie, Hayward, & Salem, 2002) or even the fact that animals are an 'absent referent' when it comes to language, making violence against animals inherent (see Adams, 1990).

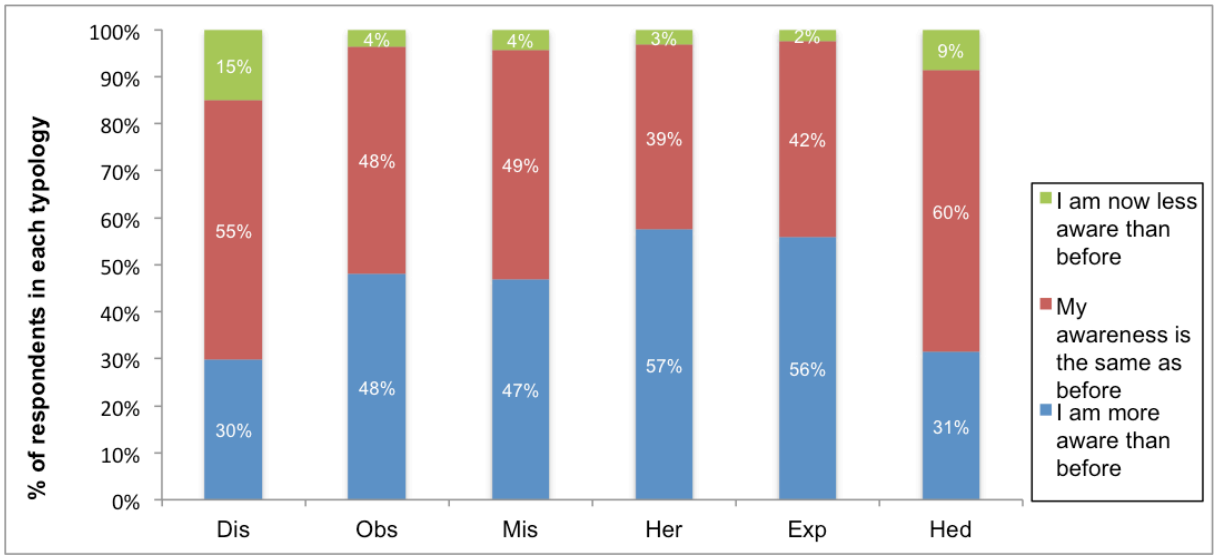


Figure 12: Animal rights issues awareness by typology (excluding don't know; n = 671)

The bar chart (figure 12) shows a comparison between typologies as well as within-typology regarding levels of awareness. There was a significant relationship between awareness and typology ($p < 0.0001$) with the *Hero* and the *Explorer* who showed more awareness and the *Disconnected* and the *Hedonist* that contained a lower proportion of participants who were more aware of animal rights concerns. This trend was reversed for participants who indicated the same level of awareness for animal rights issues. Animal concerns, as indicated previously, do not form a primary lens for many of the typologies and that might impact openness to both animal-related concern and awareness.

4.10 Animal concerns and control

Looking at the data on "what I do could have a direct impact", there were significant differences between typologies for some of the items taking concern and control into account.

Table 27 shows issues that had the least concern and locus of control in red, while the issues where typologies were more concerned and they felt they had more control are marked in green. The *Disconnected*, the *Hero*, and the *Explorer* scored significantly higher than the other typologies on concern about canned lion hunting (X^2=22.50; p = 0.0127) and whale hunting (X^2=33.32; p = 0.0002). The *Hero* scored significantly higher than the other typologies on dolphin capturing (X^2=30.44; p = 0.0007), farm animal welfare (X^2=25.44; p = 0.0046), and poaching (X^2=25.94; p = 0.0038). With regards to animal cruelty and abuse (X^2=36.21; p = 0.0001) the *Hero* and the *Explorer* scored significantly higher, whereas the *Observer* and the *Hedonist* scored significantly lower than the other typologies. The *Disconnected* scored significantly higher than the other typologies on factory farming (X^2=31.43; p = 0.0005). When it comes to domestic animal welfare (X^2=47.27; p = 0.0000), the *Misunderstood* and the *Explorer* scored significantly higher than the rest.

Table 27: Animal concerns and control

Typology	Dis	Obs	Mis	Her	Exp	Hed
Canned lion hunting	14%	2%	5%	16%	12%	3%
Whale hunting	23%	4%	3%	15%	5%	12%
Dolphin capturing	8%	3%	3%	17%	7%	8%
Animal cruelty/abuse	35%	29%	42%	49%	49%	25%
Factory farming	26%	11%	8%	18%	16%	10%
Domestic animal welfare	24%	34%	48%	42%	50%	33%
Farm animal welfare	15%	14%	12%	25%	15%	8%
Poaching	15%	6%	11%	23%	15%	8%

Least concern and low locus of control – red

Most concern and higher locus of control – green

Figure 13 is a line graph that shows how canned lion hunting, whale hunting, dolphin capturing, animal cruelty/abuse, factory farming, domestic animal welfare, farm animal welfare, and poaching issues trend across typologies.

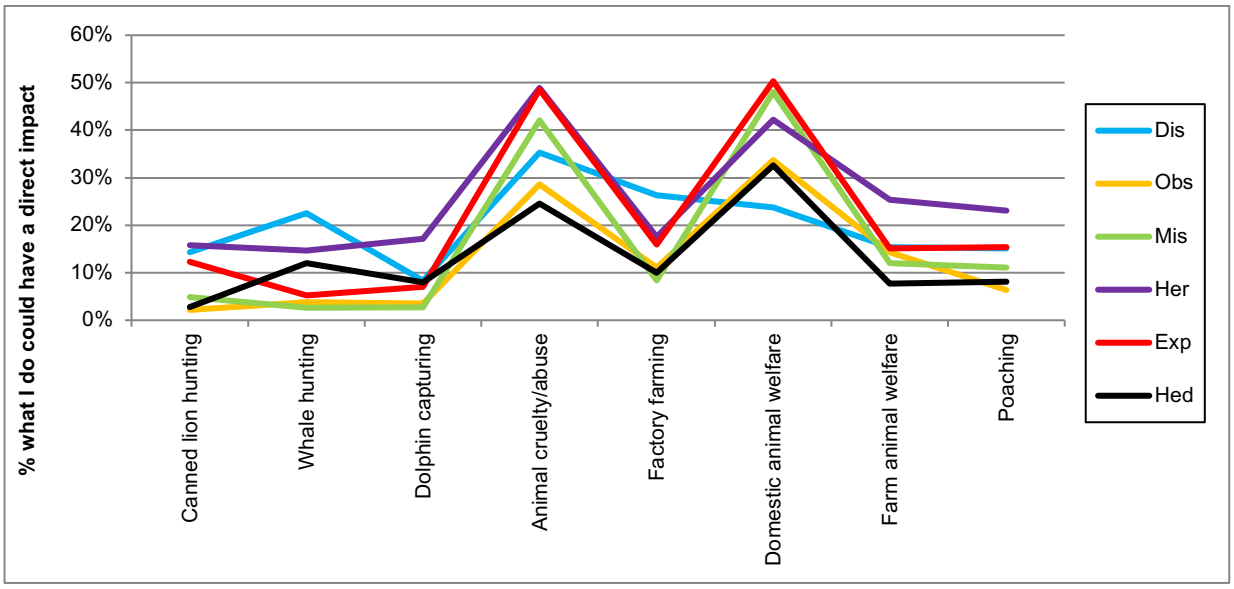


Figure 13: Typology similarity and differences on animal concerns

Overall trends, when isolated from other issues, show animal cruelty/abuse and domestic animal welfare as high regarding concern and control. These are potentially the issues that participants felt they have more control over and that are closer to them, compared to problems like canned lion hunting and poaching. An explanation for the trend might also be a possible increased awareness of the link between animal abusers and human abuse as well as other crimes in South Africa (see Nibert, 2013).

Factory farming scored lower on the overall trend. This could be due to moral disengagement where people feel that they are not the ones inflicting abuse (see Mitchell, 2011) and therefore they have no control. A study by Tiplady, Walsh and Phillips (2013) found that although the Australian public was emotionally affected by media coverage of cruelty to farm animals, nobody did anything about it, possibly because they felt powerless. Interestingly, in this study the *Disconnected* scored significantly higher when it came to concern and control in factory farming (X^2=31.43; p = 0.0005) compared to other typologies, but this should be interpreted in the context of their high score on apathy (seen in Table 15). Understanding these trends is essential for understanding how and who to target in single-issue campaigns.

4.11 Typology and demographics

There were significant differences on some demographics and typology. Significant differences emerged between age groups (X^2=93.20; p<.0001), gender (X^2=14.89; p<.0001), ethnicity (X^2= 115.04; p<.0001), religion (X^2=45.54; p<.0001), and education (X^2=38.17; p=.0084) across the typologies. Appendix 16 contains further demographic details per typology.

Overall, the *Disconnected* had the largest number of younger (18–25 year old) participants compared to the *Explorer*, which had the most older (46+ year old) participants. The *Misunderstood* and the *Explorer* had more female participants compared to the *Hero* and the *Hedonist* where there were more men than women. The *Misunderstood* and the *Explorer* had more white and fewer black participants

compared to the *Disconnected* and the *Hero* where the pattern was reversed. The *Explorer* had fewer Christian and more non-religious participants compared to the *Disconnected* and the *Hero*, where the trend was reversed. The *Misunderstood* and the *Explorer* contained more participants and the *Hero* and the *Hedonist* had fewer participants with postgraduate degrees compared to the other typologies. The below section describes the demographics per typology in detail.

4.11.1 Typology environment growing up

In the overall sample, 38.6% of participants grew up in large cities and 38.9% in small towns. This is a reasonable number since two-thirds of South Africa (62%) currently lives in urban areas (see Turok, 2012). Figure 14 shows how typologies compare in terms of the environments they grew up in.

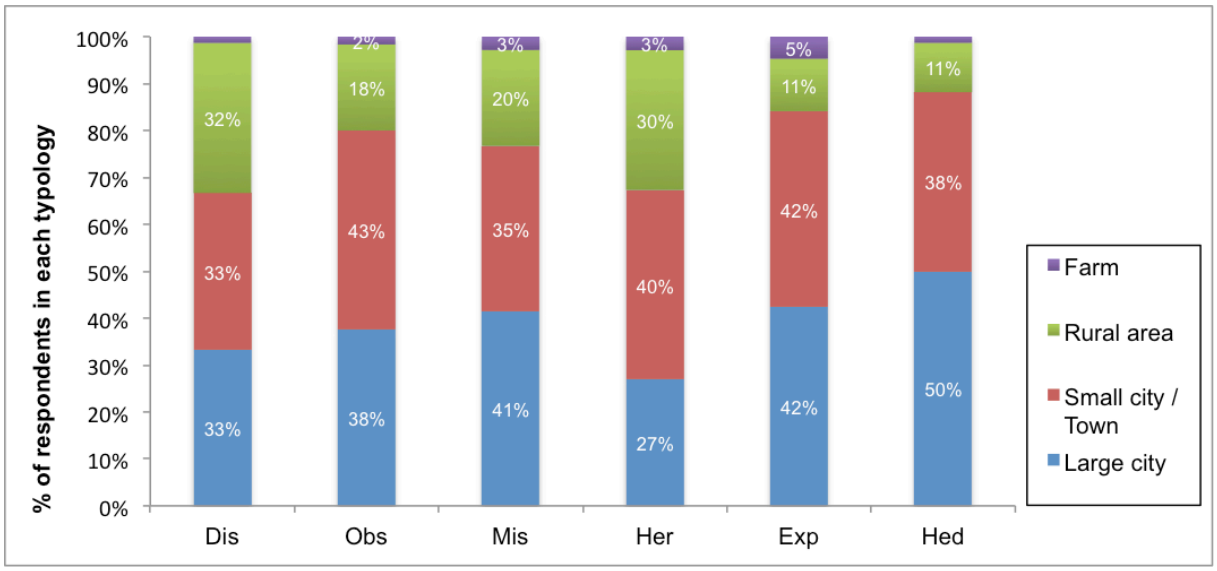


Figure 14: Typology environment growing up (N = 721)

There was a significant relationship between environment in which participants grew up and typology (X^2=34.82; p=0.00261) where the *Hero* had fewer and the *Hedonist* had more participants from large cities compared to the other typologies. The results suggest a relationship between growing up in a city and disconnectedness from nature. For the *Hedonist,* having grown up in large cities might play a role in understanding their disconnectedness from nature (see Kareiva, 2008). The *Explorer* had fewer, and the *Disconnected* and the *Hero* more, rural participants compared to the other typologies.

4.11.2 Typology by age

In the overall sample, 56.8% were aged 35 years or younger. Figure 15 shows how typologies compare when it comes to age differences.

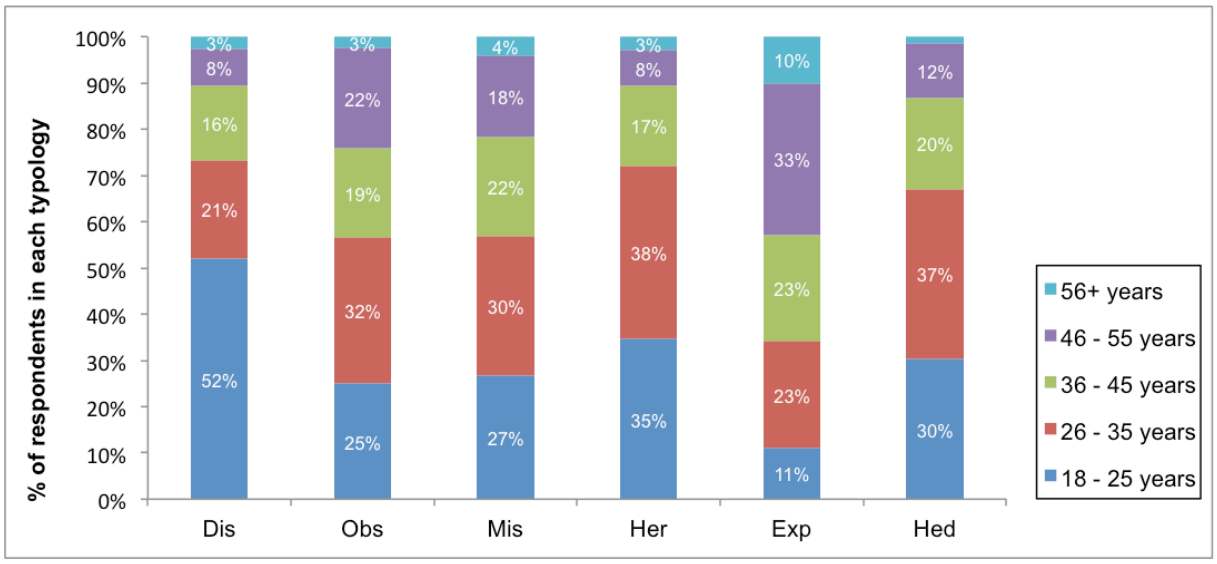


Figure 15: Typology by age (N = 721)

There was a significant relationship between age group and typology (X^2=93.20; p<0.0001) where the *Disconnected* consisted of the most significant amount of younger (18-25-year-old) participants compared to the *Explorer*, which had the most older (46+-year-old) participants. Since the *Explorer* is more connected to nature than the *Disconnected* this suggests that age could play some role in emotional connectedness.

4.11.3 Typology by gender

In the overall sample, 60.4% of the participants were female. Figure 16 shows the gender splits per typology.

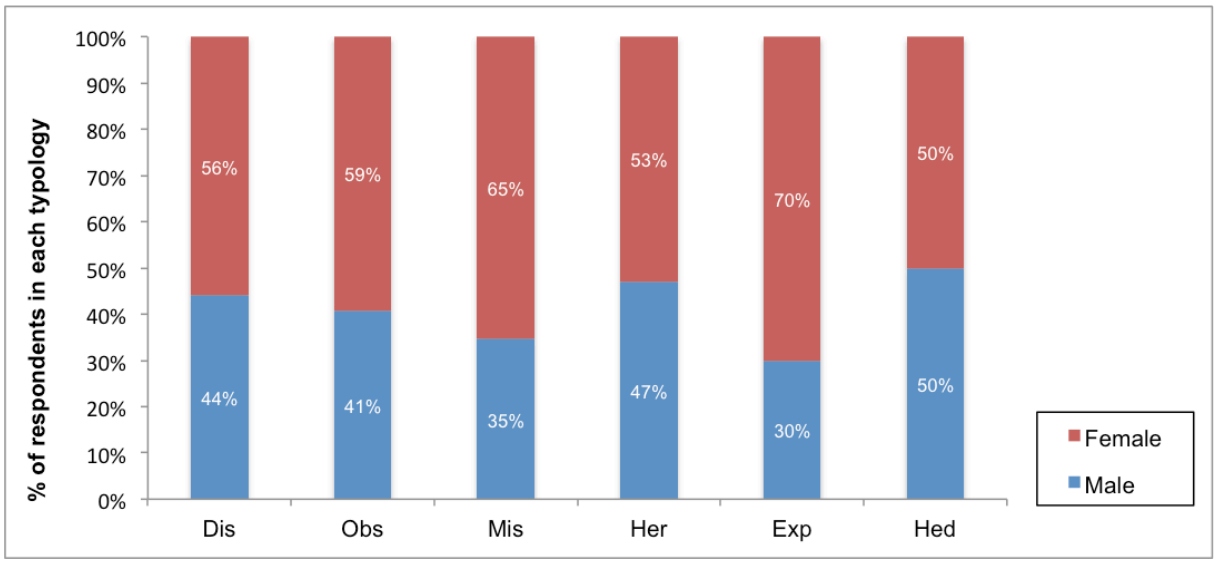


Figure 16: Typology by gender (N = 721)

A significant relationship existed between gender and typology (X^2=14.89; p<0.0001). The *Misunderstood* and the *Explorer* had more female participants compared to the *Hero* and the *Hedonist*

where there were more males than females. Looking at the profile of the *Explorer* this confirms that females might engage more in environmental issues than men (see Hunter et al., 2004) but since the *Hero* has a high connectedness score and more males, it suggests that gender is not a reliable predictor of environmental concern.

4.11.4 Typology and ethnicity

In the overall sample, 40.9% were white and 38.2% were black participants. 2.3% of the participants refused to give their ethnicity. The sample ethnicity compares to South African middle class statistics that show proportions of 51% black, 9% mixed, 6% asian and 34% white (see Ndletyana, 2014) suggesting a white bias amongst middle class South Africans. Figure 17 shows how typologies are constructed when it comes to ethnicity.

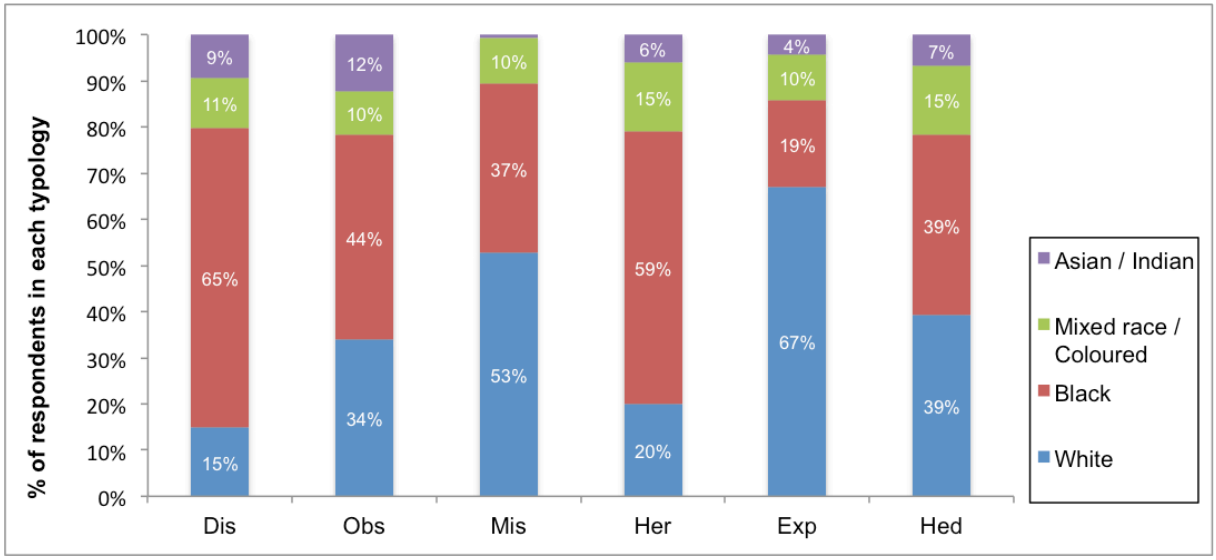


Figure 17: Typology and ethnicity (Excluding other and refuse; N = 693)

The white bias in the sample was not a concern as those with large carbon footprints drive environmental issues. The white population of South Africa has a far higher household consumption expenditure than other population groups (see Stats SA, 2012) and therefore they have the highest carbon emissions and environmental footprint (see Bouvier, 2004). Du Nann Winter (2000) says: "*Because the greatest forms of environmental destruction occurs at the extremes of the wealth continuum (overconsumption by the planet's financially elite population and desperate measures taken for short-term survival by the planet's destitute population), long-term sustainability may well require serious attention to economic redistribution"* (p. 519). It is, however, important to understand ethnicity and relationship to nature regardless of footprint. This compares to the SASAS (2005) study where black respondents were least concerned about the environment, followed by mixed, indian, and then white participants (see Struwig, 2010).

A significant relationship existed between ethnicity and typology (X^2=115.04; p<0.0001) where the *Misunderstood* and the *Explorer* had more white and fewer black participants compared to the *Disconnected* and the *Hero* where the pattern was reversed.

4.11.5 Typology and religion

In the overall sample, 72.6% participants were Christian where 40.4% described themselves as somewhat religious and 33.9% as very religious. Figure 18 shows religiosity by typology.

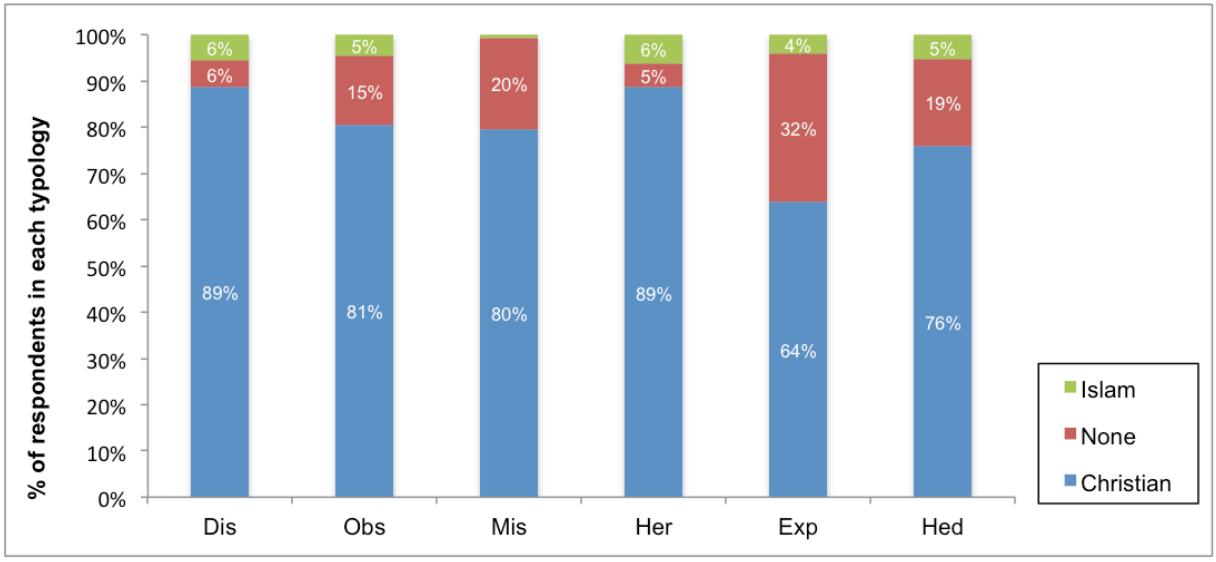


Figure 18: Typology and religion (Christianity, Islam and None only; N = 669)

A significant relationship existed between religion and typology (X^2=45.54; p<0.0001) where the *Explorer* had fewer Christian and more non-religious participants compared to the *Disconnected* and the *Hero* where the trend was reversed. When looking at the degree of religiosity, the *Hero* was the most religious with 87% indicating that they were somewhat or very religious. The *Disconnected* was the second most religious at 83%. The *Observer* had 77% slightly or very religious compared to the *Hedonist*'s 74%. The *Misunderstood* and the *Explorer* had the fewest religious people with the *Misunderstood* consisting of 67% somewhat or very religious and the *Explorer* of 66% as somewhat or very religious. Religion has some explanatory power when it comes to an understanding of the relationship that people have with the biosphere (see Kollmuss & Agyeman, 2002).

4.11.6 Typology and home language

In the overall sample, 46.6% spoke English as their home language. 78.9% of participants reported that they were completely competent in English and 21.1% reported that they were mostly competent in English. Lower competence categories were excluded from the study for reasons discussed in the methodology chapter. Figure 19 shows 7 most prevalent South African languages per typology.

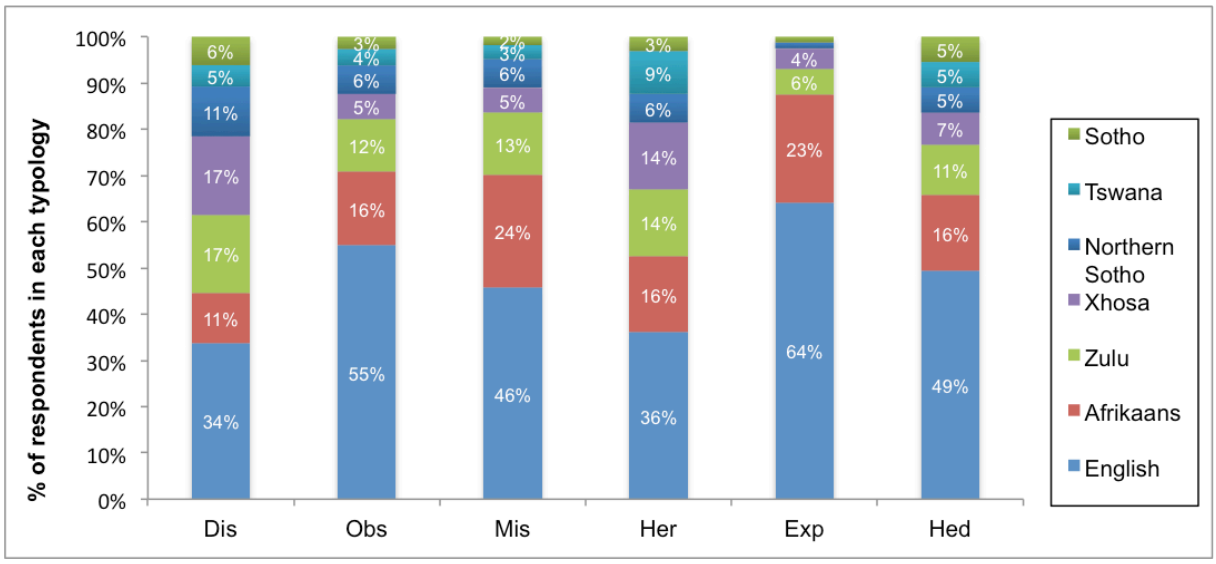


Figure 19: Home language (7 most prevalent languages only; N = 671)

A significant relationship existed between language and typology (X^2=76.93; p<0.0001) where the *Observer* and the *Explorer* had more English-speaking participants compared to the *Disconnected* and the *Hero* where the trend was reversed.

4.11.7 Typology education

In the overall sample, 45.7% of participants had a university degree and 30.4% had a certificate or diploma while 19.8% had matric. There was a significant relationship between education and typology (X^2=38.17; p = 0.0084) with the *Misunderstood* and the *Explorer* containing more participants with postgraduate degrees and the *Hero* and the *Hedonist* fewer participants with postgraduate degrees compared to the other typologies. The *Explorer* had fewer participants with undergraduate degrees compared to the other typologies. This compares to the SASAS study (2005) where those who are less educated are less concerned about the environment. Figure 20 shows education level per typology.

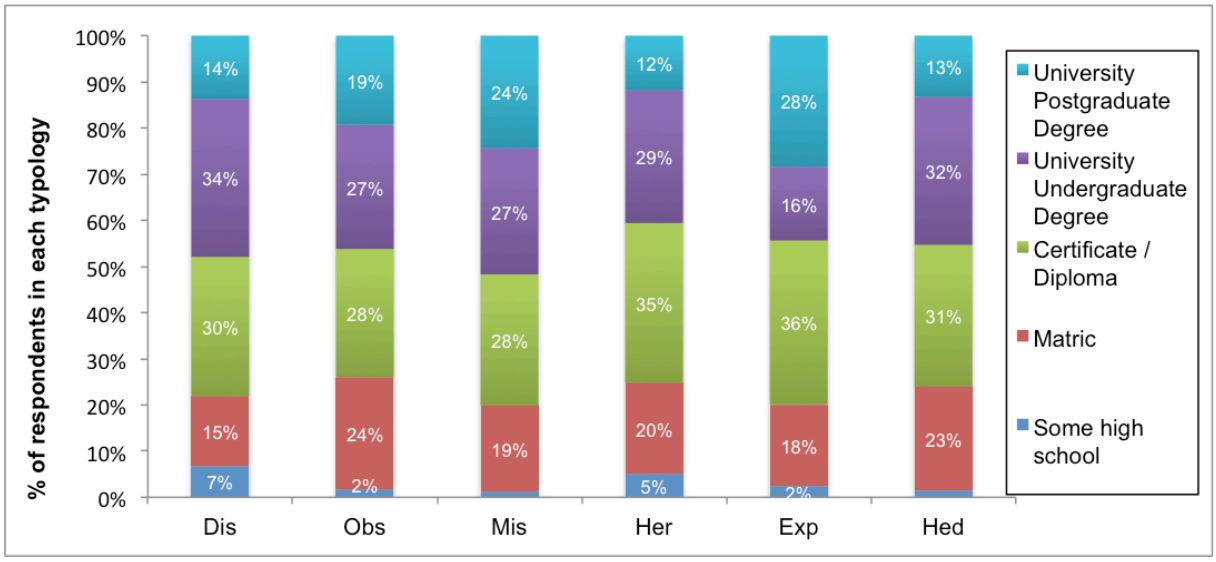


Figure 20: Typology and education (N = 721)

4.11.8 Typology occupation

In the overall sample, 56.6% of participants were employed full time. Figure 21 shows typology and their respective occupations.

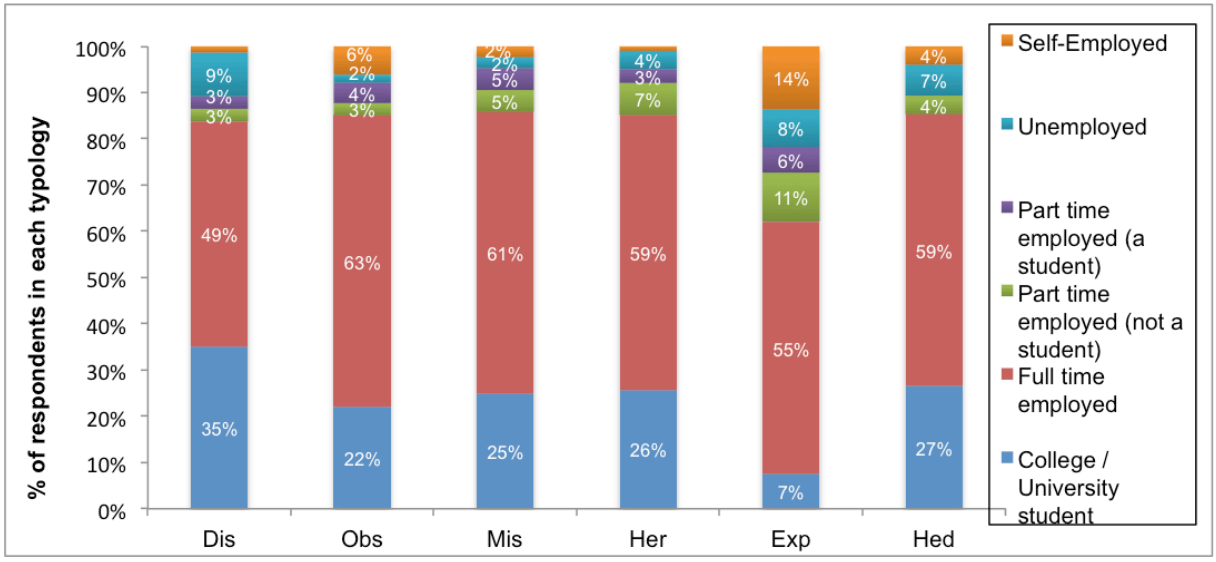


Figure 21: Typology occupation (N = 721)

For those employed full time, student, part-time employed and not a student, part-time employed student, unemployed, self-employed (n = 694) there was a significant relationship between occupation and typology (X^2=81.65; p<0.0001) with the *Explorer* that contained fewer and the *Disconnected* that contained more students compared to other typologies. The *Explorer* had more self-employed participants compared to other typologies.

4.11.8 Typology and personal income

A substantial percentage of the black, mixed and indian adult population are already in the 'emerging middle class' (R50 000 – R300 000pa) with white adults making up the largest population group in higher income brackets (R300 000+pa) (see Van Aardt & Coetzee, 2009). Figure 22 shows the personal income levels per typology.

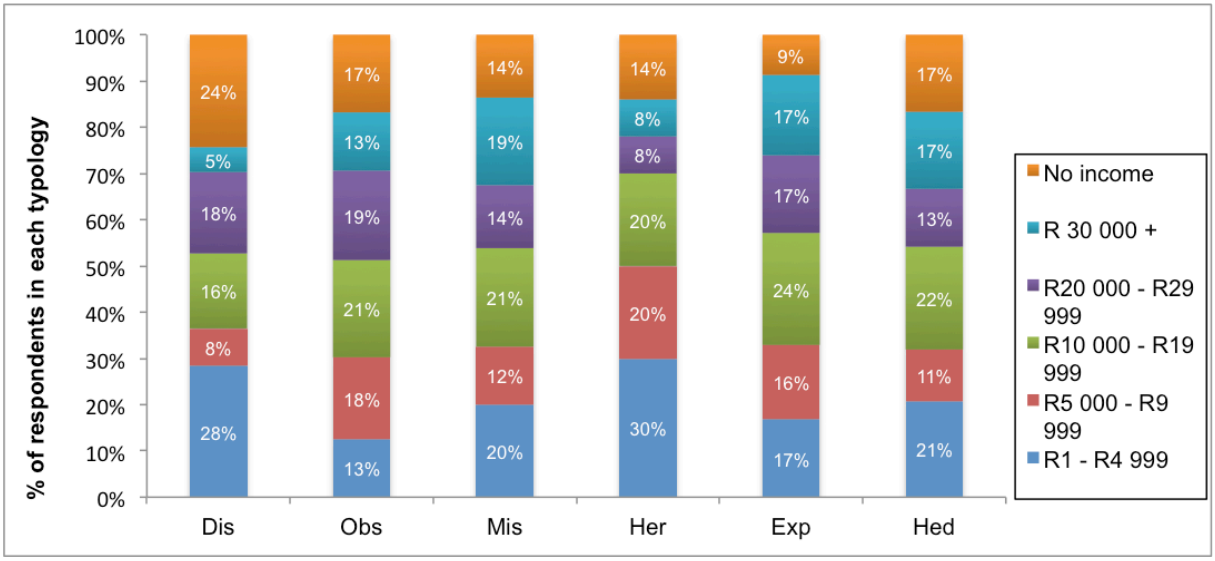


Figure 22: Typology and personal income (excluding don't know and refuse; N = 695)

In the overall sample, 34% of participants earned less than R10k per month, and 13.9% of the respondents had no income. This is understandable since 21.1% of the participants were still students (some represented in the *Disconnected* typology) and 9.2% were working part-time. Only 4.9% of the sample was unemployed. There was a significant relationship between personal income and typology (X^2=62.52; p = 0.010) with the *Observer* having fewer and the *Hero* more participants in the lowest income group compared to other typologies. The *Explorer* had fewer and the *Disconnected* more participants with no income compared to other typologies.

4.11.9 Typology household type

In the overall sample, 45.9% of participants lived in detached houses. There was a significant relationship between household type and typology (X^2=42.03; p=0.0027) with the *Disconnected* and the *Hero* that contained fewer and the *Misunderstood* and the *Explorer* that had more participants in detached houses compared to the other typologies. The *Misunderstood* had fewer apartment dwellers compared to the other typologies. Figure 23 shows each typology and their household type.

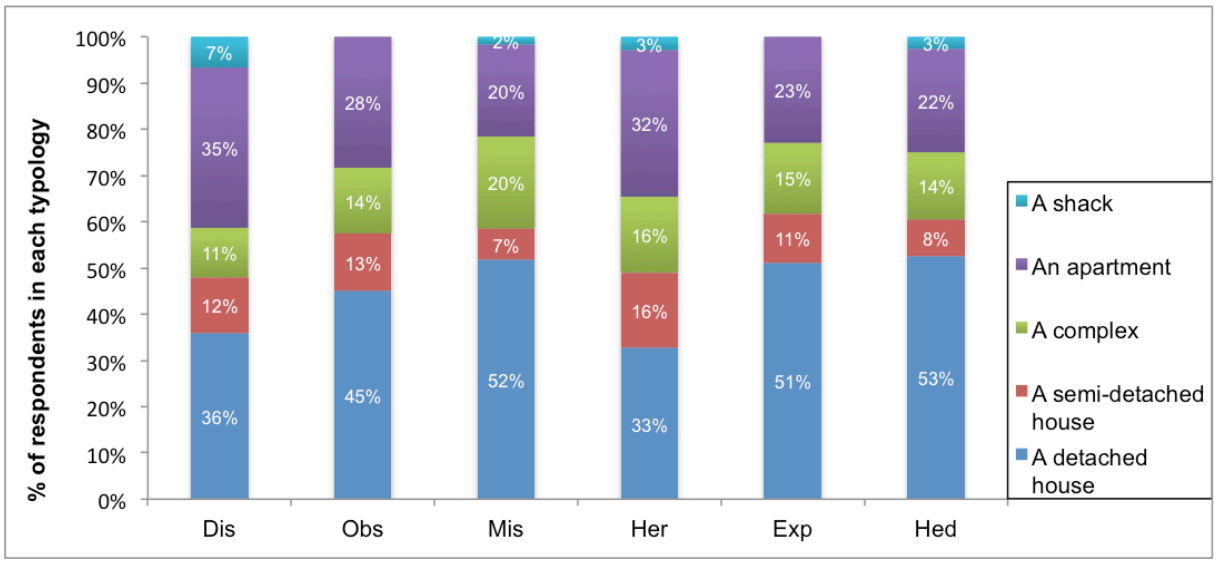


Figure 23: Typology household type (excluding other; N = 721)

4.11.10 Typology relationship status

In the overall sample 58.6% of participants were single. There was a significant relationship between relationship status and typology (X^2=65.81; p = 0.0012) with the *Disconnected* that contained more, and the *Explorer* that had fewer singles living at home compared to the other typologies. The *Observer* and the *Explorer* contained more, and the *Disconnected* and the *Hedonist* fewer married participants. The *Misunderstood* contained more singles living with others compared to the other typologies. The *Observer* contained fewer singles living alone compared to the other typologies. Figure 24 shows the relationship status within each of the typologies.

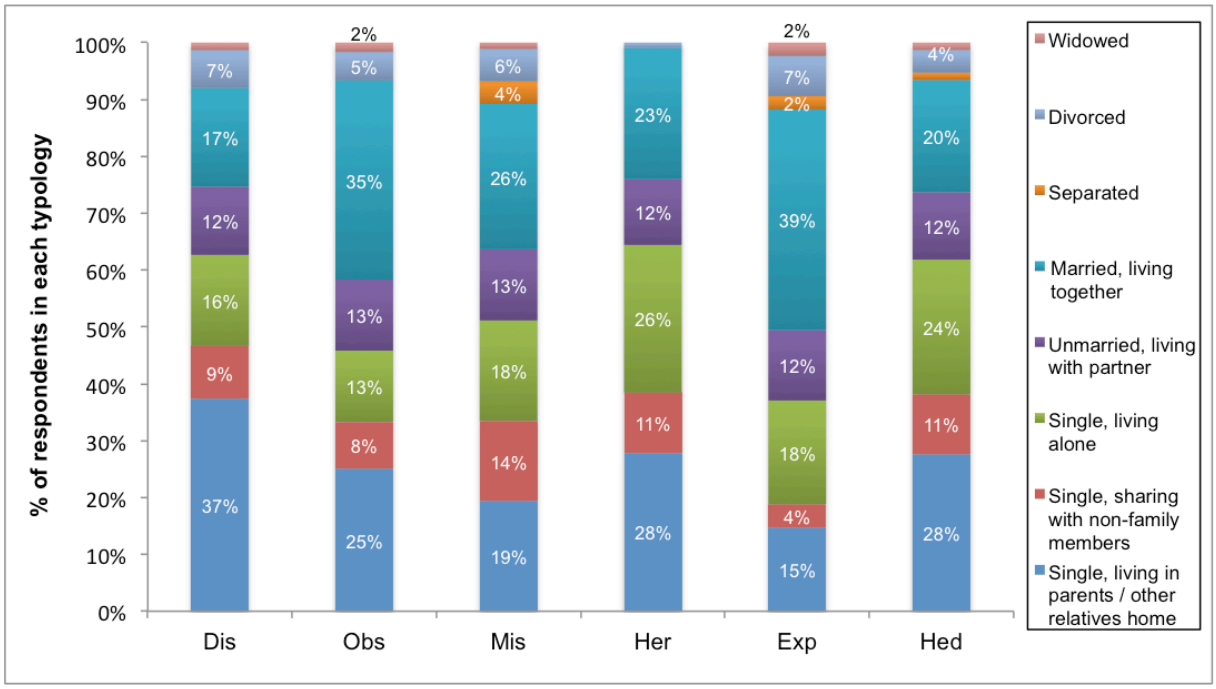


Figure 24: Typology and relationship status (N = 721)

4.12 Similarities and differences between typologies

Based on the typological results presented thus far, it is clear that there are some similarities between typologies, and there are also instances where they might overlap on certain variables. To show similarities and differences per variable, a wheel with integrated mini Venn diagrams was developed and shown in figure 25. The inner circle of the chart represents the highest scores on each of the variables, moving outward to the lowest scores. The mini Venns are not placed on data-points but rather in relation to one another on a particular variable. Moving from the inner circle further outward, the second circle represents the pillars used to construct the study and includes cognitive, affective, behavioural and intrinsic constructs. Within these, moving further outward, are the dimensions from which the variables sprout (clustering variables are indicated with a light blue star in the wheel). Typologies each have their representative colour where they are placed in relation to one another or overlapping with one another. Distance indicates similarity or difference.

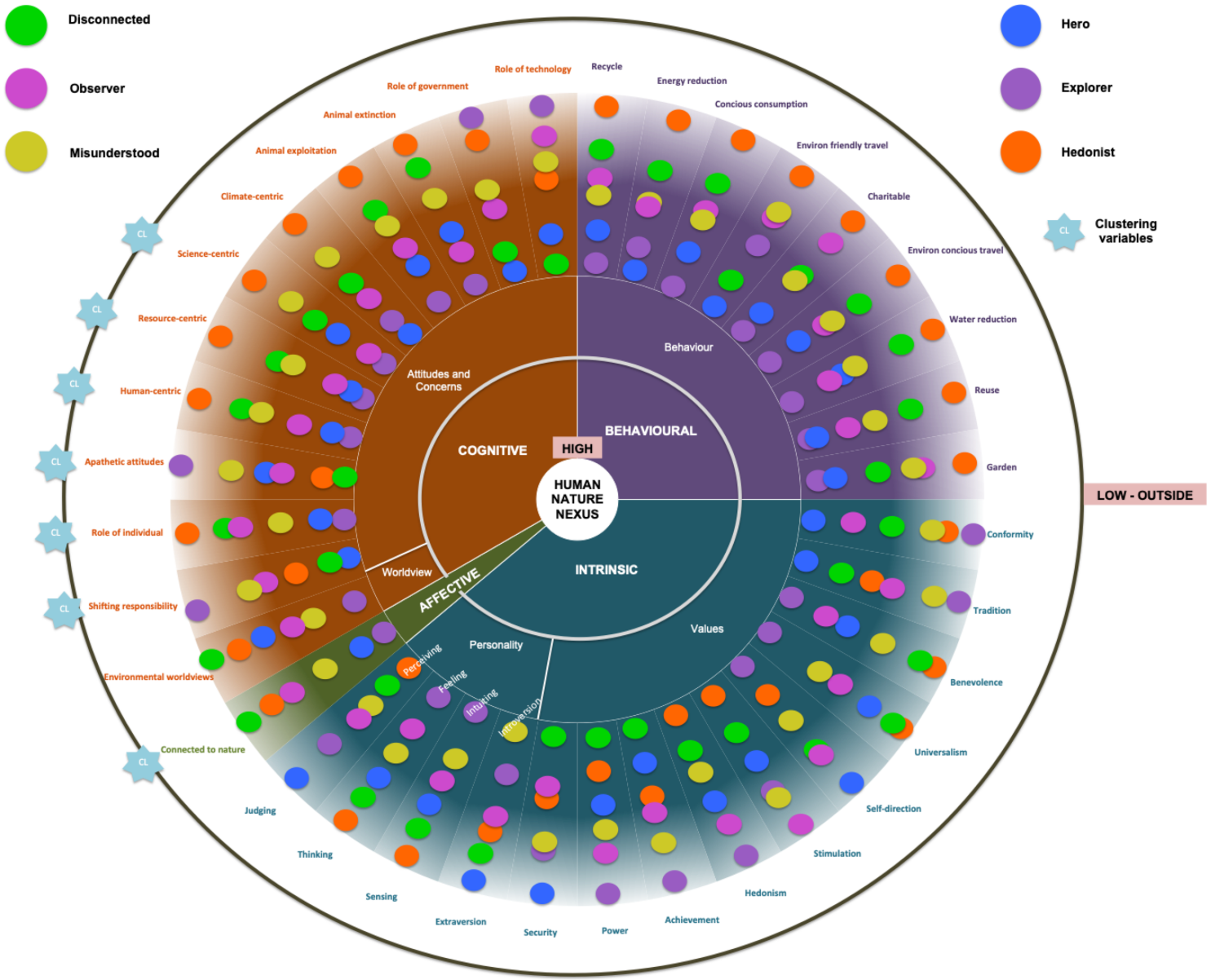


Figure 25: A Venn wheel showing the relationship between typologies on variables

Figure 25 shows that the *Explorer* and the *Hedonist* are often the furthest from each other. The *Observer* hovers in the middle on many of the variables with close proximity to the *Misunderstood* on certain variables. The *Explorer* and the *Hero* often sit close on certain variables just as the *Disconnected* and *Hedonist* often sit in close proximity to each other.

Although there are distinct areas where typologies are similar or different it is important to point out some key distinguishing characteristics per typology. These key characteristics are shown in Table 28 and will be used (the bold insights rather than the descriptors) in Chapter 6 for joint display systems diagrams.

Table 28: Key distinguishing characteristics of each typology

	Key distinguishing characteristics					
Columns[2]	**A**	**B**	**C**	**D**	**E**	**F**
	Disconnected	**Observer**	**Misunderstood**	**Hero**	**Explorer**	**Hedonist**
Demographics	**Struggling financially, trying to make it in the city, usually from rural areas**	**Suburban families, middle class**	**Educated, non-religious singles living in suburbia**	**Less educated, earning little, more black males, less postgraduate qualifications**	**More older white females, typically non-religious, postgraduates, grew up with less extended families**	**Grew up in large cities, typically male, likely to be unmarried and no postgraduate qualification, less extended family**
	• Likely to have grown up in a rural environment • Mostly 18-25, black, students • Typically Christian, second most religious typology • Many have no income • Single, living at home	• Less in lowest income • Fewer living in urban areas; more living in suburban areas • More married	• More white, females • Least religious participants • More with no grandparents • More with postgraduate qualification • More living in a detached house • Fewer in urban but more living in suburban areas	• Less people from large cities growing up • Significantly more males than females • More black participants • More Christians and less non-religious participants • Less participants with a	• Fewer grew up in a rural environment • Most participants aged 46 and older, English, white females • Less Christian and more non-religious • Grown up with no grandparents, nor aunts or uncles	• Likely to have grown up in large cities • More males • Less extended family • Less people with a postgraduate qualification • More had mothers with high school • Fewer married participants

[2] The columns are labeled for each of the typologies for ease of reference in Chapter 6 (integrative chapter).

			• More singles, living with others	postgraduate qualification • Significantly more participants in the lowest income • Fewer people that live in a detached house • More live in urban areas	• More with postgraduate qualifications • Least amount of students, less with no income • Likely detached house in suburban area	
Relationship with nature	**They have a poor relationship with nature and animals**	**They are uncommitted when it comes to concerns about nature**	**They feel affect towards nature**	**Their emotional connection to nature is mediated through a dominant social paradigm**	**They are deeply concerned about nature and animals**	**They have a weak affective relationship with the biosphere and low environmental worldviews**
	• They show the least emotional connectedness to nature compared to all other typologies (CNS = 3.8) • They are the most strongly dominant social paradigm	• They care moderately about all environmental related matters • They scored low-moderately on connection to nature (CNS = 4.43) and environmental	• They have a moderate-high emotional connection to nature (CNS = 5.04) and low-mod apathy (2.07) • They have moderate environmental	• Environmental affect is incongruent with environmental worldviews • They score moderately-high on their emotional connection to nature (CNS = 5.25) and low-	• They are the most affectively connected to nature (CNS = 5.93) and have the strongest environmental worldviews (4.11) • They are the most concerned about individuals taking	• The biosphere is not something they think about, notice or are concerned about • They score the second lowest on nature connectedness (CNS = 4.16) and environmental

	oriented (NEP = 3.21) • They are less concerned about issues related to animal extinction (3.42) and animal exploitation (3.21) (E.g. canned lion hunting, animal cruelty, poaching, animal rights and welfare, vivisection etc.)	worldviews (NEP = 3.70) • They feel moderately about animal exploitation (3.66) and animal extinction and the role of government in addressing environmental issues	worldviews (NEP = 3.74)	moderate on their environmental worldviews (NEP = 3.54) • This is possibly a consequence of their highly religious views which primes a dominant social paradigm • Also suggests that their moderate emotional relationship with nature is mediated through religion / anthropocentrism rather than through affect for nature	responsibility (4.41), human-centric issues (4.47), resource-centric issues (4.81), and science-centric issues (4.29) • They are the most concerned about animal exploitation (4.26) and animal extinction (4.65) • They score very low on apathy	worldviews (NEP = 3.39)
	They are unwilling to take responsibility for issues related to nature	**They observe the urgency related to environmental issues which might cause tension with their low-moderate**	**They perceive environmental concerns as potentially rupturing**	**They are concerned about human-centric environmental problems**		**They are not concerned about environmental issues**

		affective relationship				
	• They are the most apathetic (3.20) towards the natural environment in that it is not a priority for them, they feel a temporal disconnectedness from environmental concerns and that making any changes in their own lives is too much effort • They tend to feel that environmental and animal related issues should be addressed by forces that does not involve them	• They do not feel that environmental and animal related issues are overstated or that they are a problem for future generations • But they lack a sense of personal responsibility	• They do not think that environmental, animal issues are overstated or that they are the responsibility of future generations • But this sense of immediacy does not translate into behavioural expression for this typology but rather seems to have an emotional impact on them	• This typology is highly concerned about human overpopulation, loss of natural area, waste generation, urbanization, over consumption and biodiversity loss • This typology is highly concerned about air pollution, water scarcity, natural resource depletion and water pollution • Climate change, rising sea levels, global warming, natural disasters and ozone depletion are issues they are concerned about		• They feel that individuals are not responsible for environmental issues (3.55) and score the lowest on human-centric (2.48), resource-centric (3.35) or science-centric issues (2.00) • They are the typology with the second highest apathetic attitudes (3.04) • They score the lowest on climate-centric issues (2.50) and also on animal exploitation (2.75) and animal extinction (3.18)

	like government or technology					
		They express some concern about issues that will impact humanity		**Human ingenuity will solve environmental problems**		
		• They are highly concerned about issues such as air pollution, water scarcity, natural resource depletion, water pollution, nuclear energy, pesticides, GMOs		• They believe that human ingenuity through technology will solve environment and animal issues being experienced • This means that they discount their own responsibility in solving problems but also that they believe humans are at the center of the solutions to problems		
Behaviour	**Where environmental issues intersect with their well-**	**They behave pro-environmentally in areas which have social value**	**Their environmental behaviour does not match their affect towards nature**	**They behave pro-environmentally in areas that have**	**They behave pro-environmentally**	**They do not behave pro-environmentally**

	being some claimed concern or behaviour emerges			**financial and nurturing benefits**		
	• They are somewhat concerned about environmental problems that they are likely to have experienced Overall they do not behave strongly pro-environmentally except a slight increase is seen in behaviours that benefit them, (E.g. using public transport or growing fruit and vegetables)	• The behaviours that they perform moderately-high on recycle and water reduction	• The *Observer* and 3 look different from each other but their behaviour is the same	• They recycle, reduce energy usage, use public transport, recycle tires and walk or cycle • They use grey water and grow fruit and veg	• They claim to behave moderately or highly on all environmental behaviour that means that they rot, reduce, re-use, recycle.	• They score the lowest of all the typologies on all the behavioural variables • This means that behaviourally they do nothing to lessen their impact on the natural environment
Values	**They value aspects that increase their ability to survive and enable them to avoid threats**	**They are followers that seek social approval**	**They do not value conformity, tradition, benevolence or security**	**They value conformity, tradition, achievement**	**The *Explorer* is open to the world**	**They value self-enhancement**

	• They value achievement so as to allow them to gain resources which they need for survival • They value power because it allows them dominance over others and over resources • They value security which combined with power suggests they aim to control relationships and resources to overcome or avoid threats • They value tradition through following cultural and religious ideologies	• They value conformity (0.53) but also achievement (0.31) and security (0.12) • They do not value self-direction (0.45), stimulation (-1.08) and hedonism (-0.93) • The combination of these values suggest that they do not like independent thought, challenges in life or self-indulgence and prefer to focus on areas that gain social approval	• They do not score high on any values • They do not value conformity which could suggest that they refuse to inhibit themselves according to the rules of society • They also do not value tradition which suggests that they tend to challenge customs that represent shared experiences • Their low score on benevolence suggest that they do not value caring for others which is linked to healthy group functioning and therefore they lack	• These values suggest that this typology is somewhat conservative in their approach to life and that they use social standards as a guidance to measure their own progress • Traditional values leads to acceptance of customs and ideas in culture or in religion which supports that this typology is highly religious	• They place a high value on benevolence (0.71) which means that they are genuinely concerned about the welfare of others and that they live a spiritual life • They also place high value on universalism (1.02) that means their goal is *"understanding, appreciation, tolerance and protection for the welfare of all people and for nature."* This value relates to the idea of non-judgment and to accept	• They score the highest on hedonism (-0.20) and stimulation (-0.69) that means they are driven by a life that is exciting and novel at any cost and also seek instant gratification • They score the lowest on benevolence (0.39) and universalism (0.02) which shows that they have little care for others or nature • They also value personal success as well as social status, prestige and dominance over people and resources

			a need for affiliation • They also have a low score on the value of security which corresponds to the above in that this means that harmony, stability of society and relationship is not something which is important to them		others who are different	
	They are disconnected from the outside world				**They are independent and curious**	
	• They do not value benevolence and universalism so they only focus on themselves at the cost of being connected				• They value self-direction (0.65), independent in thought and in action • Individuals should take responsibility	

					for what is wrong in the world	
					They are self-actualising	
					• They do not value conformity (0.34), tradition (-1.19), hedonism (-1.12), achievement (-0.12) or power (-2.08)	
Personality	**They operate with the head rather than heart, to protect themselves**	**They observe in order to regulate their emotions**	**They are highly introverted**	**They have a judging personality**	**They feel deeply and are intuitive**	**They are indifferent to the outside world**
	• They are more extraverted than introverted which means they are more oriented towards the external world rather than dealing with the inner world	• They are the typology that scores second highest on feeling (6.79) • Their introversion (5.96) suggest they prefer to receive information so that they can process	• They are the most introverted typology which means that they are more focused on their inner world • They do not need constant contact with the outer	• This means that they tend to evaluate information received in order to organize and plan • They tend to regulate their mental events	• They feel deeply and intuitively and those personality traits guide in their relationship with the biosphere	• They do not attach emotional value to objects, people or events • They tend to be somewhat emotionally blunt

	• They score low on feeling • They have a judging approach to life and is motivated by thinking and logic	the information in order to regulate their mental events	world, people and events • This disconnect between inner and outer world might explain why their inner world is connected emotionally to nature but in the outer world their behaviour does not match what the inner world feels.			

4.13 Summary

The quantitative phase aimed to identify and describe typologies based on their relationship with the biosphere. The results showed six well-differentiated typologies based on intrinsic, cognitive, affective and behavioural variables. At an overall level, the quantitative results suggest that demographics alone cannot explain variance when it comes to the human-nature nexus. Personal safety, social challenges, and economics were in the top 5 rated concerns for all typologies. Only when economic interests are less of a priority does this allow for space to be concerned about the natural environment. Lastly, typologies might look different, but their behaviour was often similar. This means that even if people are concerned about the environment, it does not mean they necessarily behave pro-environmentally. The quantitative results justify a more in-depth exploration of the differences between types of people and their relationship to the biosphere, with the aim of understanding why these typologies manifest in this manner.

CHAPTER 5

QUALITATIVE RESULTS

5.1 Introduction

Six typologies were identified during the quantitative phase using cluster analysis based on intrinsic, cognitive, affective, and behavioural constructs. Although variances on the construct items and factors have adequate explanatory power, these results require further exploration in order to gain a deeper understanding of how typologies function as systems, what this means for their relationship with the biosphere and to build theory. This chapter aims to explore the ontogeny of each typology and how this is different[3] for each typology, through a procedural tapestry of emergence[4]. The aim of Grounded Theory analysis was to reach theoretical saturation through concretisation of category properties, functional pillars, micro or macro conditions, actions/interactions, consequences and associated dimensions (Bohm, 2004; Strauss & Corbin, 1998).

The qualitative analysis drew on Straussian Grounded Theory (Strauss & Corbin, 1998). Each typology will be described by showing its main categories, cascading properties and dimensions. Categories are concepts that stand for phenomena. A number of properties form categories. Properties are therefore characteristics of a category or a delineation that defines or gives the category meaning. Each property plays a role in how it delineates the category and how it demonstrates its function in the typological system. Properties have various roles in the system. They can play the role of functional pillaars[5] that operationalise the category. The micro or macro conditions are the circumstances or situations that form the structure of the studied phenomena. Actions/interactions are participants' routine or strategic responses to issues, events or problems and in turn, consequences are the outcomes of the actions/interactions (Strauss & Corbin, 1998). Dimensions are inherent in each of the above properties as they introduce variability that is required for saturation and generalisability to be achieved.

In order to illustrate how the above categories, properties and dimensions emerge, some of typology 1's properties will be used as an example for orientation and described in Table 29.

Table 29: Example of Grounded Theory architecture

Elements	Role in Grounded Theory	Typology 1 example
Category	Concepts that stand for phenomena	• Abandoned Category • Disconnectedness Category

[3] When trauma emerges as a central theme in a particular typology, this is not to say that other participants in other typologies have not experienced trauma, but rather that trauma is the center of their stories and shapes how they make meaning in the world. Not all participants in each typology experience everything in the same intensity or in the same way.

[4] If a category emerged amongst only few participants in a typology after continuous coding and constant comparisons, the category was abandoned. Each category had to emerge in some way, even in varying intensity, in each participant in that typology to be identified as an emerging category. That means that although there are some participants who do not fit a typology strongly, they have all the categories in common with the other participants in that typology through the process of continuous coding and constant comparison.

[5] The functional pillar label is a creation of the researcher. During the Grounded Theory analysis some properties did not fit the roles as described by Strauss & Corbin (1998) and therefore the idea of a 'functional pillar' was created in order to show which properties operationalise a category.

Property	Characteristics of a category, delineation that defines or gives the category meaning	• Type of abandonment • Religion shapes worldview • Survivalist • Abandoning experience • Detachment from outside world • Detached from nature • Climate change not in their control • Disconnected from climate change responsibility • Fractured views
Functional pillar	A property that operationalises the category	• Type of abandonment operationalizes the Abandoned Category • Detachment from outside world operationalizes the Disconnected Category
Micro condition	Narrow in scope and possible impact so generally contexts that are relevant to the individual's life	• There is no micro condition for this typology since they are disconnected
Macro condition	Broad in scope and possible impact so generally context that is relevant to the broader society	• Religion shapes worldview is a macro condition as religion is something that could be relevant to the broader society
Consequence	How categories interact and then how they alter a situation or affect a phenomenon	• A consequence of being abandoned is a survivalist mindset • A consequence of being disconnected is being detached from nature and also feeling like climate change is not in their control
Action-interaction/Process	What participants do or say to deal with phenomena, routines, discussions individuals have with themselves	• How they deal with their abandonment and survivalist way of being is through a range of emotional responses. • They deal with being disconnected by disconnecting from climate change responsibility. Another consequence of being disconnected is having fractured views.
Dimensions	The range along which the property of a category vary	**Since there are many, only few will be shown here to demonstrate**

	giving specification and variation to the category and subsequent theory	• Type of abandonment dimensions are: maternal, paternal, familial, societal, occupational • Religion shapes worldview: shapes the way they see the world, shapes the way they live in the world

This chapter introduces the emerging categories, properties and their associated dimensions with the aim of building context for the development of the typological system and theory. The process of saturation was achieved through reaching empirical limits of the data. This means that a range of dense quotations, across participants within a typology, supported each category and property and no new emergences took place. Only some of the quotations were selected to demonstrate the emergence of each category in this qualitative results chapter. Other substantiating quotations, if needed for further clarification, are contained in the auditing documents (Appendix 10 – 15). Typology labels were constructed during the Grounded Theory process and were required to be useful, explanatory of the typology relationship with the biosphere as well as unique (Eppler, Hoffman & Pfister, 2011),

5.2 Typology 1: The Disconnected

"Somewhere, somehow, I got to Durban. I was very young. I had to try and balance being a young adult in a very foreign place where you don't have your mother, you don't have your father, you're looking for a job, you're trying not to get HIV" (CL1P4)

"*I was always that part of the puzzle that had to move along. It affected me in such a way that I don't trust anybody now. I don't trust people, I can't. It feels like they are there for a short space of time and then I have to move out. No matter what I did, I just could not fit in. From 2011 until now I am still there but just cannot fit in. It is just that feeling that we are family but I just don't belong. I don't know why it is like that. They make most of their choices without including me. You know that family member that is just there to eat but you can go without calling each other for three months"* (CL1P1)

5.2.1 The Disconnected: Categories, Properties and Dimensions

The identity-inspired label that described this typology is *The Disconnected*. There emerged two categories, namely abandonment that provides insight into the experiences and worldviews of the typology and detachment that explains this typology's relationship with nature and climate change. There is reason to believe that abandonment leads to detachment. Within the two categories there emerged nine properties with associated dimensions. Figure 26 shows how each property plays a role in the typological system as a functional pillar, micro condition, macro condition, consequence, or process.

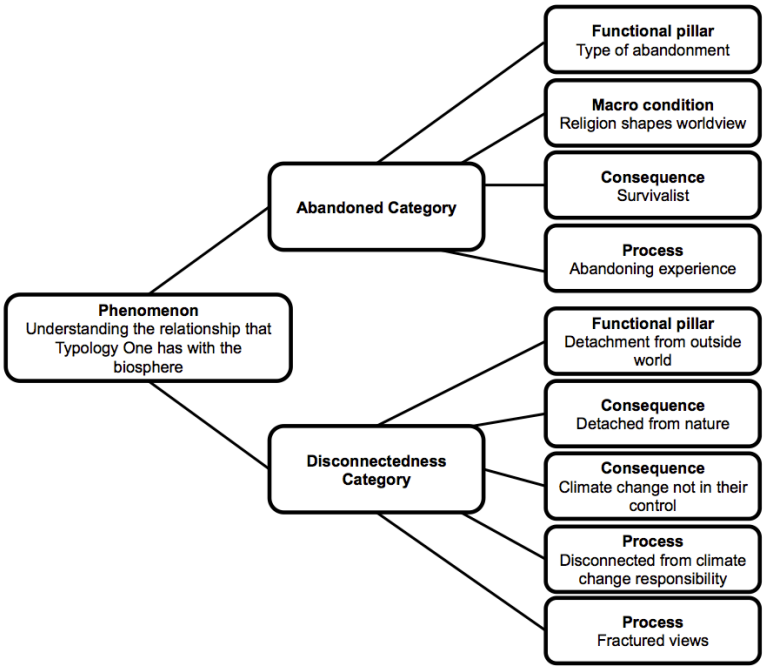


Figure 26: The theoretical structure for the Disconnected typology showing categories and properties

5.2.2 Abandoned category

This typology experienced or fears experiencing abandonment by individuals or groups that should provide a sense of belonging. Being abandoned is different to being misunderstood (typology 3) in that feeling misunderstood is a construct that manifests from the individual regardless of whether the person has close relationships or not. Therefore, these two concepts can be understood as juxtaposed: abandonment is the desire to belong but being unwillingly pushed away by external forces (typology 1) whereas misunderstood means belonging yet feeling like they do not (typology 3). Abandonment (typology 1) triggers a survivalist mindset. Consequently, religion emerges as providing this typology with comfort through shaping their worldview.

5.2.2.1 Functional pillar: Type of abandonment

The type of abandonment is the functional pillar in the system since it described a distressing experience/s that shocks the system and defines how the system operates. Even a single experience of abandonment could trigger a range of positive feedback loops within the typological system and could change the system purpose. This, in turn, changes relationships within the system that changes system behaviour (Meadows, 2008). Types of abandonment can be experienced from various sources, and therefore the dimensions to be described are: maternal, paternal, familial, societal and occupational abandonment.

Type of abandonment dimensions

- ➔ Maternal
- ➔ Paternal
- ➔ Familial
- ➔ Societal
- ➔ Occupational

Figure 27: Abandoned category functional pillar dimensions

Maternal abandonment was the experience of emotional and/or physical abandonment by a mother. CL1P1 described a range of abandoning experiences such as, *"I was raised by my grandmother. My father passed on, I think it was in 1995, so I was probably way too young to know about that. My mother left me when I was six months old and that is all I know".* CL1P3 described physical abandonment as he was raised first by his sister and later his grandmother because his mother immigrated, *"I've got a sister and she basically took care of me when I was a bit younger...".* CL1P4 described emotional abandonment and abuse; *"I grew up in that environment where I have to submit to everything. We were not allowed to ask questions or say 'No, mamma I won't do this.' It was not allowed. So, I grew up in that environment".* Maternal abandonment is problematic for this typology since the mother should create a sense of safety and security for the child. With the mother physically or emotionally absent, this typology ends up feeling insecure and unsafe.

Paternal abandonment emerged combined with other abandoning experiences. CL1P4 described her father's abandonment as leading to abuse from her mother, *"With my parents, we grew up in a, I wouldn't say a broken home as such, but my father didn't stay with us for long. He would come on Fridays, and leave on Sundays. So, my mother was there. I was young, but I could see that their marriage wasn't stable. It wasn't how marriage was supposed to be because there was another woman that my father had in some area where he used to spend almost all his time. So, my mother grew up having those frustrations".* CL1P5 described her father's abandonment as leaving her with the responsibility of taking care of her smaller brother, *"I would just say it's his wife because they have like two kids together".*

Familial abandonment emerged in this context as a consequence of pressured and expanded family systems. CL1P1 spoke of 14 children being dependent on his grandmother and experiencing rejection, *"I was always that part of the puzzle that had to move along. It affected me in such a way that I don't trust anybody now. I don't trust people, I can't. It feels like they are there for a short space of time and then I have to move out".* Later, his uncle was forced to look after him and he felt emotionally abandoned by his family, *"We stayed there…he had five children, so I had five cousins and I was the sixth child but I just could not fit in. No matter what I did, I just could not fit in. It is just that feeling that we are family but I just don't belong. I don't know why it is like that. They make most of their choices without including me".* CLP2 described being abandoned by his family after losing his job, "*The family didn't really assist what they should have assisted as a family bond and network. Your next of kin, those are the people you're dependent upon, but, that didn't happen".* The familial abandoning experience is problematic for

this typology as it leads to a lack of trust in relationships and therefore having to rely on oneself for survival.

Societal abandonment was the experience of being abandoned by broader society. CL1P2 shared how the apartheid government evicted his family, *"I grew up in Bridgetown. In 1969 we landed in Bridgetown after we had to vacate District Six. So, we moved from District Six to Simon's Town and then back to District Six because of whatever happened/transpired in that era. We had to move out of District Six. So, in 1969, we landed in Bridgetown. There were no real roads*". As a policeman during apartheid, CL1P7 ended up with a criminal record due to a shoot-out after mistaken identity, *"At the end of the day it was Walter Sisulu and his bodyguards that were driving in convoy and they were on route home".* CL1P6 described fear of being abandoned by society, *"I fear most ending up alone. I don't want to not have anybody when I'm older. I don't know why it scares me so much".* CL1P4 described isolation, *"I remember never having friends. My friend was my sister to the point that I cannot make friends as an adult, because we were those very scary kids. My mother, every time, would be beating us".* Societal abandonment leads to this typology feeling alone and in a position of survival.

Occupational abandonment was described as the experience of being rejected by a job or career to which they attached high value. CL1P2 unknowingly lost his job after becoming ill, *"Unfortunately, at that particular time, I ended up in hospital because of stress and cholesterol problems, and, it affected my heart, then. When I came back, there was no contract. I didn't know that the contract was up for review. I walked into an empty office. I sat there for two or three days, and, it became a week later and I started calling the people to find out what was happening as to why I was sitting alone, or what was happening, to me. They didn't give me too much of an answer. There was no sort of work/job, for me. I left, and I was at home for a year and a half with no work".* CL1P3 described a situation in which he really wanted to get into doing a psychology degree but was rejected, "*I went to [x] College, I studied the Bachelor B.Psych so that was three years and then after the third year, they said maybe this is not for me, they told me, they said I would not connect to the clients".* Occupational abandonment leads to this typology feeling insecure and unworthy in the world.

5.2.2.2 Macro condition: Religion shapes worldview

Religion is a construct with broad appeal in South Africa and shapes the worldview of this typology. The participants used religion (Christianity, Islam etc.) to navigate experiences, therefore it forms a macro condition. Religion as a worldview has two dimensions, namely that it influences how they see and how they live in the world.

Religion shapes worldview dimensions

- ➔ Shapes the way they see the world
- ➔ Shapes the way they live in the world

Figure 28: Abandoned category macro condition dimensions

Religion shapes the way they interpret the world. Religion saved CL1P1's grandmother from severe illness, *"My grandmother did actually survive, because I think it is faith".* CL1P4 described religion as helping her get through difficult times, *"Whenever I feel it's too much, I think this is what kept me sane. In spite of everything happening, I just talk to God, and I believe in that".* CL1P6 described God as her nucleus, "*I think God is my centre. It's a very big part of me".* Religion shapes views of nature and climate change. Climate change is represented in the Bible for CL1P2, *"From a religious aspect, it's (natural disasters) a sign of doomsday, of judgment day".* CL1P2 said worshipping nature is a sin, *"He makes workship of the tree. The tree becomes his God and he leaves his religion behind. Yes there's God in nature as well, because God created it. So, why not worship God instead of worshipping nature?*". CL1P7 continued, "*Water is always top of mind when you think about the Bible. God let it rain when it destroyed everything, and it was only Noah with all his animals on the arc".* Religious referencing is a way for this typology to deal with a world from which they feel abandoned.

Religion shapes their behaviour. *"On Sundays I do sometimes go to church…"* (CL1P1), *"Yes, I am very religious, however, I'm not the kind of person who would be having the symbols, or the deities, or the whatever's, but I pray a lot"* (CL1P4). CL1P6 saw herself as God's little helper, *"A lot of people stereotype me because of my race, I'm Indian. So, a lot of people stereotype 'Oh, she's like Hindu'. I'm actually Christian. So, I feel like that's my purpose, to go around and, be God's little helper, and do what I can".* They believe that nature is at the mercy of humans to *"decide if we want to do away with nature"* (CL1P1). CL1P3 said animals should be used, *"We know that they are there for people, actually if you really think about it, the farm animals are there for us, so their role they are all kind of sheep in a way, because they don't really have a choice. So, you can say their role is a submissive role, they submit to people"* (CL1P3). This is supported by CL1P4, "*For me, what I think about nature is God provided us with all these things to make use of them".* CL1P7 noted that God made animals first before humans to allow humans to use them. Religion plays an important role in the system, possibly in part due to the survivalist nature of the typology.

5.2.2.3 Consequence: Survivalist

Survivalist is a consequence of abandonment, as the typology needs to make themselves sacrosanct, and everything else profane. Survivalist stories range (dimensions) from having to depend on others to survive but also having only themselves to depend on.

Survivalist dimensions

- ➔ Depending on others
- ➔ Depending on self

Figure 29: Abandoned category consequence dimensions

They depended on others for their survival. CL1P1 described situations in which he was highly reliant on his grandmother, *"I think about it now and I would not have survived if I was in that environment, but I did survive, and I think I should be grateful for that"* and also his uncle, *"I had an uncle that worked in mining, actually* (grandmother) *forced him to send me to this primary school".* CL1P5 spoke about the

concept of sugar daddy being popular, "*Yes. Everybody back home, like a husband has a girlfriend outside. I'd say 99% of the men have girlfriends outside their marriages".* CL1P4 relied on a woman to look after her son while she earns money to support her family as well as extended family, *"I'm paying her. I have known her since 2012. She helps me to take care of the older one. I can, basically, say she was the second mother to my son".* Having to depend on others for survival makes the typology feel vulnerable.

The typology often felt like they can only depend on themselves. CL1P1 described depending on the self as a mindset, *"I just had that I might not have money, but I am not poor somehow",* with CL1P3 noting that this self reliance can feel like a burden, *"I feel like sometimes, like the world … I've got the world in my hands and I make what I can out of it".* Other participants described practical ways of supporting themselves through difficult times with CL1P2 having said, *"What I did in the interim* (after losing my job) *was, basically, to set up small internet cafes just to get some income to put food on the table".* CL1P4 worked as a domestic worker to pay for her studies and family expenses, *"I worked as a domestic worker".* CL1P6 also worked while studying, *"I need my money"* and CL1P7 described bouncing back after having been retrenched, *"Yes, so I have this job now from about March, so about seven months that I have been working there".* Experiences that trigger independence have empowering value that contrasts feeling vulnerable.

5.2.2.4 Process: Abandoning experience

Abandoning experience is the emotional reaction of abandonment. The dimensions of this property suggest that the typology oscillates between feeling burdened, isolated, or lost. The typology expresses these negative emotional processes because they often feel like they do not have control over what happens to them.

Abandoning experience dimensions

- ➔ Burdened
- ➔ Isolation
- ➔ Loss or lost

Figure 30: Abandoned category process dimensions

The *Disconnected* described feeling burdened. CL1P1 explained burden associated with his extended family, *"They emotionally blackmailed me. They said we took you in when you were like that, and now you can see the road is clear and (you are) about to be a dentist and now you just want (to move out). So, I was blackmailed like that, so I stayed".* CL1P2 described being overwhelmed, *"My motto and my mantra at that time was, and still is, 'I carry the world on my shoulders",* as he reflected back on having to head up the household as a youngster after his father passed way, *"You have to be dad for all of them. You have to be a brother to all of them. I was the oldest of the sons. That responsibility became mine".* CL1P4 described feeling overwhelmed by responsibilities, *"… I have to also, somewhere and somehow, provide for the two families that I have. So, it's quite difficult for me".* Burden comes with guilt, *"I'm very family orientated. I care for everyone else, and I want to help, even if I feel it's too much for*

me. When I don't do it, I feel very guilty" (CL1P4*).* Having experienced abandonment, they felt responsible for not doing the same, even if it causes them to feel overwhelmed, guilty and burdened.

They described feeling alone. CL1P5 had to deal with her problems by herself, *"But, sometimes, I like to keep things to myself, like thinking, having peace of my mind. I always do that every day" and "Yes, by myself thinking about things. Like everything i.e. my life; myself; what went wrong".* CL1P6 noted that her isolation from her mom stems from fear, *"Umm, I feel like if I do a lot of things, like if I do something bad, I'm afraid to go to my mom",* whereas CL1P1 described reaching to God when feeling alone, "*I just talk to God. Whenever I feel it's too much, I think this is what kept me sane. In spite of everything happening, I just talk to God, and I believe in that".* CL1P3 mentioned that he might have an emotional block that is isolating him from his dream career, *"Because I didn't want to wait another year and they still say no, I know my personality and that's probably what's coming through I probably got this emotional block or something".* The abandoned typology expressed a sense of isolation from others and the world, retreating, and only counting on themselves.

They also described a sense of experiencing loss and feeling lost. CL1P2 described material loss after experiencing occupation abandonment, *"That didn't last for too long, so I had to sell the house. The first thing I sold was the car, and then I sold my house. So, the journey begins, again".* CL1P5 said that she feels lost, "*The dilemma is that I don't know if I want to be in a relationship or not. When I was young, I always told myself that I don't want to be in a relationship because it just complicates things".* CL1P7 described a general sense of loss when he said, "*I mean we are going to lose more things. Yes…no, in the world we are going to lose more things. Things like pets, a house, animals, food supplies".* CL1P3 described how he lost a year of his life, *"Because I actually failed grade ten and when I failed grade ten, obviously I got stuck with the previous grade nines then came to grade ten and that was when I met better friends and that is when my shell started coming off".* As a coping mechanism for the negative emotional processes experienced by the typology, they disconnect from the outside world.

5.2.3 Disconnectedness category

Disconnection is a defense mechanism for this typology. Detachment is not situation specific but rather a generalised state of being that means they are also detached from nature, and that they perceive climate change as not in their control but rather as an inconvenience and somebody else's problem. There is reason to believe that detachment as a coping mechanism creates opposition with the inherent need to belong. Therefore, there is an emergence of fractured views in which the typology described mixed ideas about the self and the outside world. Due to their disconnectedness, there is no micro condition because their experience of life is dualistic; self versus other.

5.2.3.1 Functional pillar: Detached from outside world

Being detached from the outside world is a functional pillar for this category as it provides benefits for the system dynamics. It allows the system to focus on self-preservation and self-enhancement in an attempt to seek equilibrium. They express a focus on material success rather than, for example, on spiritual growth. This illustrates an inability to form meaningful human and nature relationships.

Detachment from the outside world dimensions

- ➔ Focus on self preservation
- ➔ Focus on self enhancement

Figure 31: Disconnectedness category functional pillar dimensions

There was a focus on self-preservation through self-respect, and self-concern. CL1P1 described self-pride in saying *"I never thought of degrading myself"* and that, *"I value life itself. But I value it so much that I want to invest in it".* CL1P2 spoke about only considering things that benefits him directly, *"If it's beneficial to me, then I will implement it. If it's not beneficial for me, I won't implement it…".* CL1P3 described persistence as how he managed to secure an internship for himself, *"My persistence paid off by nagging and irritation to them",* and CL1P1 said, *"I just had this thing in my mind that I would make my way".* CL1P7 expressed the need for self-preservation in relation to climate change, "*I sometimes say to myself, 'what will happen if there's a drought, or a flood, or like a volcano'? Is it, still, part of nature? So, I'm quite worried about that i.e. 'what will happen, to us? Will there be like the next generation after us having stuff like that?' It could kill me, if it kills".* CL1P7 was concerned about running out of oxygen, *"And if that is true that the (ozone) layer is going to break, then we won't have anymore oxygen and then it is goodbye for all of us".* Climate change poses a threat to the *Disconnected* system's self-preservation.

Achievement and power enhanced self-importance. CL1P6 said, *"I'm that lady. I'm running my own IT company here. I'm doing really well".* CL1P5 described her dream, *"It's to own a construction company of my own".* CL1P3 described his current achievement, *"I don't know if you heard about the game Call of Duty. I used to play Call of Duty the fourth one, Modern Warfare, and I used to play quite competitively, and I went to the events and I don't want to boast but I was quite good and I used to play online".* Similarly, CL1P1 noted, *"I was an overachiever in primary school" and "I got a better education than friends of mine and than other children in the village that had both parents".* CL1P2 noted, "*We were basically hand-picked to do this, and what we're currently doing is an open access network which is called Wi-Fi".* CL1P4 described her passion that override her circumstances, *"I was raised in a place where there were no academic qualifications, and all that. For me, I was passionate about studying".* A focus on self-preservation and self-importance is a positive feedback loop as it further disconnects the system.

5.2.3.2 Consequence: Detached from nature

Being detached from nature is a consequence of being disconnected from the outside world. They show emotional disconnection through apathy and behavioural disconnection in their inability to see how their own behaviour might negatively influence the wellbeing of the biosphere. They objectify nature as a service provider.

Detached from nature dimensions

- ➔ Apathetic relationship
- ➔ Services humanity

Figure 32: Disconnectedness category consequence dimensions A

Apathy towards nature manifested as anthropocentrism. CL1P2 said, *"We need some more housing for people, but we need to look closely at what we're doing, and how we're doing it. So, if we're going to break down nature, that is a God given fact, it was there before us, before we were born. Why don't we utilise that or use the environment for our own benefit?".* CL1P3 described taking care of nature for personal gain, *"…you are using nature to your advantage but in a way, you are taking care of it, you are taking care of the tree for a tree to give you fruit".* CL1P4 believed that nature is there to be used, "*For me, what I think about nature is God provided us with all these things to make use of them. Like, how they are doing those logs, and taking them somewhere is related to what I grew up with. For us to cook we had to go to the forests to gather some wood. So, this is how I used to do it. We believed God provided this for us to use them".* CL1P6 described a generalised sense of apathy, *"I think some of us are trying, and, umm, I know people look past it, and I think that's because they feel like they have other things to worry about".* The typology expresses the view that nature is an object to be used.

They believed that nature serves humans. CL1P1 described human supremacy; *"We are the supreme of nature. We control everything that could happen in nature and we can decide if we want to do away with nature".* CL1P5 said, *"I've just really come to think about it, like, now. We need them. We use them for different kinds of things, like the sunflower for like cooking oil, and medicine",* and CL1P2 noted, *"Why can't we use nature's remedies, like we used to before, instead of using drugs?".* CL1P6 extended this perception to farm animals when she said, "*Like, they provide the manure, and all those things, and our milk. I wouldn't say their purpose is there to like to feed us. That sounds really bad, but yes, that's kind of like what they're there for. They're there for us to breed them, and like not let them live in such bad conditions, but to look after them. But, like, they're there for us, like for people to use",* with CL1P7 in agreement when he said, "*Chickens give eggs, and meat. Everything has its purpose and whether you are a vegetarian or not, it is part of the cycle to keep life going".* This dimension described the idea that humans are masters over nature and therefore exploitation is justified.

5.2.3.3 Consequence: Climate change not in their control

Detachment from the outside world and nature for the *Disconnected* leads to thinking that climate change is not in their control while it might be an inconvenience in their lives. This means that climate change could trigger fear, since they do not feel in control of things that happen to them, and therefore causes the system to disconnect further. Part of feeling that climate change is not in their control is that they feel solutions and behavioural change needs to come from others.

Climate change not in their control dimensions

- ➔ Inconvenience for self
- ➔ Solutions by somebody else

Figure 33: Disconnectedness category consequence dimensions B

Climate change was only noticed when there is personal impact. CL1P1 talked of cold, *"It means the weather pattern's changing like it is spring now, but we still feel cold".* There is confusion, *"This is now springtime. We've still got the idea this is springtime. We see the weather changing. The weather is not right, yet"* (CL1P2). CL1P4 found cold weather annoying; "*I never ever had a jersey with me. It was never cold, never…but now…WHOA! It is like I am on the Drakensberg mountain all over again where you have to sleep with the heather and aircons on…WHOA, it is so cold! When you say climate change…it is happening".* CL1P6 and CL1P7 mentioned the drought as affecting them. On the other hand, CL1P3 felt no impact, *"I don't suppose it would impact me too much to see it, I will notice it, I mean there has been tornadoes in Johannesburg, for that I am a bit wary, I mean I don't want tornadoes".* The strongest experienced inconvenience expressed associated with climate change, is changing weather. Climate change is elevated in importance when it directly affects the *Disconnected* system.

They believed that climate change solutions need to be implemented by others. CL1P1 pointed to the other, *"You could just go green and try and use more emails and phone calls, but we don't want to".* CL1P2 suggested using technological development, *"That is how we've progressed. We've progressed with technology. But, how do we use technology to the benefit of nature and to the benefit of society?"*. CL1P3 mentioned others doing the work, *"I think everyone should play their part. In Muizenberg every weekend when we drive past the Blue Bird Market, you see along the railway lines there's people dressed in that reflective clothing, you can see and I don't think they are government of council, they more people just volunteering".* CL1P5 felt that telling others will make a difference, *"I think I have to like let my friends and my family know at first, and then the community next".* CL1P7 described himself as not recycling but felt that this was allowing informal recyclers to collect his recyclables and therefore others are doing their part. Climate change is the 'other' in this system.

5.2.3.4 Process: Strategies for disconnecting from climate change responsibility

The typology employs a range of strategies, as a process, to retain their disconnectedness from climate change. They release responsibility from themselves through denial that humans cause climate change or through the cognitive process of uncertainty seeking.

Strategies for disconnecting from climate change responsibility dimensions

- ➔ Deferring/denial
- ➔ Uncertainty

Figure 34: Disconnectedness category process dimensions A

Climate change was deferred to God's plan, proximity or just not as a concern, *"I believe that it is not about what man is doing to the planet but maybe it is just about God's plan because nobody can really explain the creation thing"* (CL1P1). CL1P2 agreed, *"I'm looking at it from a religious perspective that, maybe, it's God's way of cleansing the earth".* CL1P5 suggested that climate change has religious connotations, "*Umm, I don't believe it in a scientific perspective. I believe it in the religious perspective that it is God*", and at the same time CL1P7 noted, *"…everything is dry. Water is always top of mind when you think about the Bible".* Additionally, there existed a disconnect, "*The only time I am worried is when I was home and I could see the drought is here. But then when I am in Cape Town, I forget about that and I even forget that there is something like climate change*" (CL1P1). CL1P3 expressed a lack of concern, *"I don't really worry about, I see climate change, but it's not a worry. I think I am probably like most people just blind and that it is just happening".* Religion and other psychological distancing strategies were employed by this typology to disconnect from climate change.

Another strategy that was used is uncertainty seeking, where the typology did not know any facts about climate change and therefore used uncertainty to justify apathy and disconnect. "*Nobody can really explain that it was supposed to be summer now"* (CL1P1). CL1P3 said, *"But let me ask you a question …Do you think, I know some people as for example if I buy paper that paper was obviously manufactured from trees do you think me buying paper is contributing to the climate change?".* CL1P4 struggled to express thoughts about carbon, "*I think the purpose of the ocean is to, maybe, balance the carbon emissions (laughs). I don't know!",* and equally CL1P5 showed some confusion, *"Climate change is when, I don't know, I think I'm confusing it with weathering. The changing of the climate, or like the sky. I do not know. What is the climate?".* CL1P6 said, "*People are not understanding how big the issue is".* Uncertainty shows the apathy and emotional distance between the typology and climate change.

5.2.3.5 Process: Fractured views

Disconnectedness, in a world where humans need to belong, means that this typology has inconsistent ideas about themselves and the world. This is a process that emerges as they, perhaps subconsciously, try to deal with the phenomena of being disconnected. Their relationships are fractured, and therefore instead of it providing them with a sense of security and belonging, it places a void between them and the world. They need to counter the desire to belong in order to protect the self, even though their own identity seems uncertain.

Fractured views dimensions

- ➔ Mixed ideas about self
- ➔ Mixed ideas about outside world

Figure 35: Disconnectedness category process dimensions B

The *Disconnected* had mixed ideas about the self. CL1P1 said *"I am an introvert…no I am not an introvert, I don't know how to define myself",* similarly CL1P6 noted, *"I don't know, hey. My identity, I think, would be like a very caring person. I'm trying to find the words…"* and confirmed by CL1P7 *"Geez, that is a very difficult question. I don't know (how to describe my identity)".* When asked to describe their

relationship with nature CL1P2 showed confusion around whether he sees himself as a creator or a destroyer, *"I see a person that is busy working with the environment, creating an environment, and at the same time, breaking down our environment"* (CL1P2). CL1P4 described a range of opposing ideas about herself, *"My identity – mmm, that's a really broad one. As much as I can take perspectives, I try to gel with everyone else. I am a very forgiving person, warm-hearted, but I can get very, very angry when need be. But I am a very shy person. People don't notice that".* CL1P3 also described incongruence, *"I care a lot, as much as people say it looks like I don't care, I do care".* It is possible that disconnectedness from the outside world has led this typology to become disconnected from who they are.

The *Disconnected* seemed to have a general mistrust of the world. CL1P5 described herself as unsociable because she prefers to be with her own thoughts, "*But, sometimes I like to keep things to myself, like thinking, having peace of my mind. I always do that every day".* CL1P4 said, "*I tend to be very reserved when I first meet a group of people",* and CL1P1 described his approach to the outside world as flawed in that *"I am not so good at meeting new people"* contrasted with *"In my workspace I can, I love meeting new people but in my personal space I don't".* Here he described that meeting people at work is potentially a superficial encounter whereas meeting people personally might require more depth and connectedness and is something that he dislikes. CL1P6 said, *"Sometimes, I am bit too much for people".* The desire to feel safe supersedes the desire to belong.

5.3 Typology 2: The Observer

"For me, it's like this person is just sitting, looking outside, and it's raining, and they're just thinking. This is what this means for me" (CL2P3)

"Exactly. But, this card jumped out at me, when I looked at it. It's not something that I can comment on myself, in my experience, but, like nature would be somewhat of an escape of reality, like running down the mountain, like putting on, it's called an Oculus Rift …An Oculus Rift is the actual technical name of it, like where you escape reality" (CL2P6)

"Sometimes, looking at these pictures, when you look at certain things, which human being would have thought of this (points to screen saver which has nature scenes on it)" (CL2P8)

5.3.1 The Observer: Categories, Properties and Dimensions

The identity-inspired label that described this typology is *The Observer*. There emerged three categories namely: observer, nature as blurred, and climate change contrasts. This typology described themselves as observers who watch the world rather than participate in it. Due to this lack of participation, while still being witnesses, they experience a blurred relationship with the biosphere and climate change is a topic that creates tensions for them. Within the three categories, there emerged 11 properties with associated dimensions. Figure 27 shows how each property plays a role in the typological system as a functional pillar, micro condition, macro condition, consequence, or process.

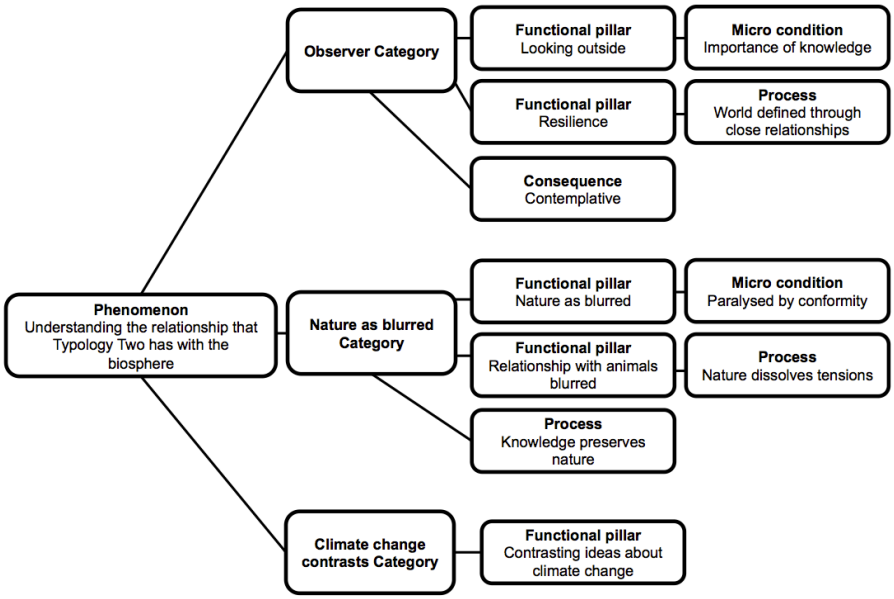


Figure 36: The theoretical structure for the Observer typology showing categories and properties

5.3.2 Observer category

The observer feels like they are looking outside at the world rather than being a part of the world. Although they describe being aware, they have the ability to distance themselves, which translates into resilience. The observer places value on knowledge and engages with the world through seeking to understand, contemplating and rationalising observations. They tend to define their world through close relationships and are conformists. They get knowledge from others and behave in normative ways. However, this causes tension between the individual versus the collective, between what they feel and what they know, and between individual values and collective values.

5.3.2.1 Functional pillar: Looking outside

Looking outside is the functional pillar of the Observer category as it charactersises how they operate in the world. The observer watches the world without feeling they need to participate. They can observe contrasting ideas expressed around them. As an observer of the world, they can move easily between various views, observations, and experiences. They are agile in moving between expressed realities, they can disengage easily using cognitive strategies, which in turn makes them resilient.

Looking outside dimensions

- ➔ Observes the world
- ➔ Observes contrasting sides
- ➔ Observes disengagement

Figure 37: Observer category functional pillar dimensions A

The Observer emerged as somebody who observes the world, does not instigate change, and prefers to think rather than do. CL2P1 said, *"Just living, you know, not being consumed by what's going on around you"*, he continued *"One of my favourite pastimes is actually just, driving".* CL2P2 described being a cognitive observer, *"I mean we sit, now, and we cry for rain. And, what am I doing? I sit, and I think".* CL2P3 continued, *"Umm, a person just reflecting on life, you know, taking a step back and thinking things through. For me it's like this person is just sitting looking outside, and it's raining, and they're just thinking".* Observing means a self-constructed boundary between self and the outside world for CL2P4, *"I see the world, particularly through my little artsy sunglasses, … and sometimes, maybe not too realistically".* CL2P5 described the challenges of not participating, "*But, when outside, I see things, and I feel affected by it in the sense, like I saw a guy throwing a plastic bottle on the road, and the guy was in a taxi and I just felt anger towards him…".* CL2P6 described sensorial disconnect; *"… like nature would be somewhat of an escape of reality like running down the mountain, … an Oculus Rift is the actual technical name of it, like where you escape reality".*

They were able to observe and reflect about contrasting sides. CL2P1 described this, *"Actually, I see God's hand as the balancing light because on the one hand you can see buildings with black smoke, but on the other hand you see green vegetation, natural streams".* CL2P2 described tension, "*The other day, I was sitting and thinking 'How am I wasting water in my household? How can I do things better?' but, then it shouldn't boil down to just me. I know I can go to so many people and encourage them to do that. I think one day I will look back and say, 'I should have done more'".* CL2P4 described tension between connection to animals versus nature, *"I mean, in terms of nature, I think I've got a special place in my heart for animals. I'm trying to find the same thing for the trees and the plants and all that. I mean that breaks my heart to think that that whale might be beached there and suffering there".* CL2P6 described the earth dualistically, *"So, society or infrastructure that comes along with society ends up being very dependent on nature".* CL2P8 said, *"If I had to get the chance often to go to xx and watch the sun set. Just to watch that because that is all not man-made".*

The Observer came across as somebody who is able to observe different perspectives and can easily disengage by employing acceptance. *"When I look at it, actually I start thinking about, and it's the same concept when it's vegetation being destroyed. Maybe, it's for a good cause. Maybe, it's to make paper"* (CL2P1). The process of disengagement manifested physically, "*I take my bottles and leave them by the gate. On Monday, there's a guy that comes to get them. He pushes a trolley and he comes and gets them and I don't even know his name, but I leave it there for him".* Disengagement is made easy by focusing on the gestalt; "*I think I see the bigger picture sometimes. I think sometimes I couldn't be bothered with silly little things that I think are immaterial"* (CL2P4), but at the same time he suggested that observing cannot be a disconnecting act, *"But inside surely, these things are eating away at us? I think we need some way of exorcising the strange unsettling things that are happening in the world".* For CL2P5 being an observer builds tolerance and that is what she has in common with nature, *"Well, I suppose in some ways, nature has been able to tolerate or to deal with a lot of what life has given it as well".*

5.3.2.2 Functional pillar: Resilience

Participants in this typology described aspects of their lives that have been challenging but because they are observers, they express reslience. This resilient approach, a key operationalized expression of their world is also a functional pillar, and it means that they feel empowered to move into different states of relating to problems and therefore empowered to think of solutions or to accept challenges. They express resilience both inward and outwardly.

Resilience dimensions

- ➔ Inward strength
- ➔ Outward strength

Figure 38: Observer category functional pillar dimensions B

Inward strength is the capacity to feel in control of their lives and how they respond to challenges. They described themselves as realists, determined, confident, authentic, intuitive, and open to showing vulnerability. CL2P2 described being a problem-solver, "*If there's one thing about me, if there's a problem, I want it to be solved, now*". CL2P5 spoke about the strength obtained through perservering through tough times, *"So, I think as a human we can associate it with that because I've been through a lot of things in my life as well but I'm still here, and I'm still pushing forward and, also persevering to get to the places I think I need to be".* CL2P8 described her resilience through strength, *"I think I can take in a lot without just crying over little things".* CL2P6 talked about confidence as empowering, *"Security – by that I mean, that whole thing, like if I want to do something, I want to do it. I don't want to be insecure of my options",* and also about authenticity, *"I have this massive thing against façade-ism, I can't take it. Just, be yourself".* CL2P7 described her vulnerability as a gateway to authenticity, *"I kind of wear my heart on my sleeves".* CL2P8 noted that being open and honest creates inward strength, *"I am a very straightforward person".* They are confident in their choices.

Outward strength is the ability to deal with aspects of life that are not in their control, such as having a miscarriage, mother being diagnosed with cancer, or not knowing a father. They were not victim-orientated, and rather practiced acceptance. CL2P2 spoke about the challenge of not knowing her father, but then she proactively started searching for him and accepting him, *"I think me accepting my father has really changed my identity".* CL2P5 described having to support her mother who lost a foot, *"I've been at home helping her cope with what happened and then I think like my life just got consumed in that for a little while, but now I'm like branching out trying to be involved with friends and stuff like that".* CL2P3 spoke about her experience of losing a child, but then accepting what happened, *"I was like 'Please God, I will do anything as long as she survives', and she still passed away".* They showed resilience during tough times.

5.3.2.3 Micro condition: Importance of knowledge

Although this typology did not have the greatest proportion of post-graduate degrees, they are the typology that places the most value on knowledge. They value knowledge because they experience enjoyment from understanding things and being able to contemplate. Placing importance on knowledge fits with being an observer because observing is knowing, but not necessarily doing. They placed emphasis during the interviews on the education of their family members, themselves, their own role as

educators, or even regrets at not finishing their education. Having an education was a social construct that was perceived to receive approval from society and therefore satisfies their need to conform.

Importance of knowledge dimensions

- ➔ Family educated
- ➔ Self educated
- ➔ Educator
- ➔ Regret not educated

Figure 39: Observer category micro condition dimensions

They spoke of having family members who are educated. *"My sister, well, she's also an industrial psychologist..."*, and *"So, my father for a while he was a headmaster at a primary school. Then, after that, he became an inspector of schools, but he's got doctorate within education"* (CL2P1). CL2P5 spoke about the value her family places on education, "M*y parents valued education a lot",* she noted further *"Umm, so the ambition also stems from my mom in the sense that my mom always complained about how she never got the opportunity to work, to study".*

They were themselves educated or in the process of studying. CL2P4 said, "*I've done my master's in education since I've come here".* CL2P6 spoke about the value of knowledge, *"Knowledge* (most important). *Because of the curious nature that I have and the understanding of things".* Pursuing the attainment of knowledge through studying was also important, *"Yes, exactly. Your class becomes your life. Then, towards the end of matric, I felt I needed a bit of a change in scenery. I moved to x this year, in January. I'm full-time studying there".* He continued to describe the value of education, *"Well, because of the stuff you do while studying engineering. You don't just study engineering to be a professional engineer"* (CL2P6).

Some participants saw themselves as formal or informal educators. CL2P2 described how she could add value to the environmental movement in a role as an educator, *"So, for me it would be a matter of educating people about the environment itself. We don't have much knowledge about that".* In the same way CL2P7 was doing this with her children, *"I'm educating my kids about it, but I'm not necessarily doing it".* These two participants suggested that they are comfortable spreading environmental information, but without actually following their own advice. CL2P4 is a formal educator and described his role, *"I mean in terms of this job, it's been really trying to make people as literate as I can. Here, that's quite tricky because it's an [x] school; many of them are dyslexic, or ADHD. They are not readers, although, the reading population is diminishing. So, I think to make people aware of the word, and the joys of the word is one of them".*

Some participants in this typology were unable to get or complete their education. They spoke about this regretfully. *"I always think that if I could go back, that's the one thing that I would definitely change* (finishing her degree)*. It would be so much different because I think that I would have gotten my degree, because the only thing that actually stopped me from getting it was because of all the stress that was*

involved with my father. Like sometimes I feel like, you know, well, I am working towards that, that I failed myself for not studying back then, for not finishing back then because, I mean, where I am right now, I shouldn't be where I am right now" (CL2P3). CL2P7 did not finish her engineering degree, *"I studied civil engineering after school, but I didn't finish it. It's kind of a regret sometimes, and other times I think 'Oh, but it wasn't meant to be'".* CL2P8 felt that society looked at her differently for not having a degree, *"The only real regret, or I don't know if it is a real regret, it is more on society, in our days there was a lot of apartheid and there was a struggle especially with my sister even when she went to [x], there was a lot of issues being a non-white. So, she had to go away from home to study. Despite that, they both got their degrees and I was the one that did not go out. Society looks at me differently when they compare the three of us".*

5.3.2.4 Process: World defined through close (human) relationships

The importance of knowledge and education shows that this typology values socially accepted norms. Therefore, they value a sense of belonging and conforming in an attempt to form close relationships. They spoke about processes of being accepted, being connected, being accepting, and caring of others.

World defined through close relationships dimensions

- ➔ Conform/being accepted
- ➔ Connected/belonging to
- ➔ Accepting of others
- ➔ Caring for others

Figure 40: Observer category process dimensions

The *Observer* expressed wanting to be accepted. They did this by being courteous, focusing on the happiness of people around them, valuing relationships, making people proud, fitting in rather than standing out, being relatable, controlling unsociable thoughts and behaviours, and not being overly competitive. CL2P2 said, *"Don't reject me. Like, I can literally cry".* CL2P3 indicated that a core drive was focusing on others, *"My core being I would say, … I like to do right by others more than anything".* CL2P4 described others as a priority, *"I think I want to make everyone feel good".* CL2P5 felt indebted to her family, *"Because my brother is paying for everything at home, I just feel like I should be doing more",* as well as her parents, *"For me, it's just like, and I want to help at home, I want to provide more for my parents because I know they sacrificed a lot for us".* This typology preferred not being in the spotlight because they like to conform, *"Not being in the spotlight. So, I prefer, like if I excel at something, and I do well at something, I don't like to be praised for it",* and *"I can be a very good people's person. I'm very relatable. I'm very approachable"* (CL2P6).

This typology felt like they belong. They did not feel isolated because they have strong family and community connections. CL2P1 said, *"I value relationships. I don't think a person can actually live and go through their life without relationships".* CL2P2 continued, *"But, we* (her family) *really have very great relationship".* CL2P5 noted that, *"… she is like a best friend because I find that I can confide in her and*

I tell her about anything that's going on in my life, to the point where I, sometimes, regret telling her because she seems stressed by it afterwards (her mom)*".* CL2P7 described her close-knit family memory, *"I just have this sunny picture in my head about it. My father would always take us out, not necessarily to places, but we would go to the beach, we would go to the mountains, we'd go to peoples' stables and look at the horses. He was like 'a jump in the car' kind of guy".* CL2P3 said her friends as close, *"But, once a month I make an appointment to see my friends...".* CL2P4 continued, *"I guess I've always been someone who'd rather have one or two close friends than 70 acquaintances".* Friends and family were described as their wealth, *"I think the warmth we had in the family and the friends we had, the type of friends we had and the closeness we had as a family, to me that was our wealth"* (CL2P8).

Due to their need to belong and conform, they described being accepting of others. They tended to avoid holding grudges, they give others space and respect, they interpret challenges as opportunities, they are trusting of others, value tolerance, and focus on the manner in which they communicate to others. CL2P5 described herself as trusting, *"Like I think also my family used to be worried that the fact that I'm naïve to people like I'm too trusting".* CL2P4 described his process of acceptance of his alcoholic mother; *"She said to me she hoped I wouldn't think of her as this old 'dronkie'* (drunk person)*. I said to her I would never think of her like that. They were both* (parents) *very lovely and charming people. It's just one of those things of alcohol".* CL2P2 described how her mother influenced her into being more accepting of others to reduce conflict, *"She's made me change the way I look at things. She's someone who would tell you 'don't fight with people'".* CL2P1 said, *"I don't believe in holding grudges. Negative energy is actually not for me".*

This typology described themselves as caring. CL2P1 said*, "So, it's always been in me, and I guess to a certain extent, to be honest, I've always wanted to get into politics because the bigger vision is helping people, doing the right thing you know".* CL2P2 continued, *"It made me want to help people more. Like normally you would say 'its not my problem', but it has really changed me so much. It has made me to care more and I have developed this passion of working with people of helping people and that for me has changed my purpose in life".* In order to show her care, she started a sanitary pad drive, *"I asked for money from my parents and my family and then we bought them, what do you call them, re-usable sanitary pads".* CL2P3 noted that, *"What I do should not hurt others, and what others do should not hurt me".* CL2P5 described caring as a process of learning, *"But, when I think there's somebody I could help, and it's not going to put me in danger, then I do it, which I've also learnt will put a dent in my pocket".* CL2P6 said, *"I'd try to make the world as utopian as possible".* CL2P7 described caring as knowing somebody, *"Sometimes, I feel like a little bit, not sad, but I just kind of think 'Oh, you know, people should really take the time to get to know someone'".*

5.3.2.5 Consequence: Contemplative

A consequence of being an observer, combined with valuing knowledge, is that this typology enjoys contemplating. This means that they are are able to think about general topics but also those more specific in nature (like religion). They move between these various contexts and situations, without attachment.

Contemplative dimensions

- ➔ Thinking about things
- ➔ Thinking about religion

Figure 41: Observer category consequence dimensions

They spoke of thinking, questioning and being curious rather than doing. CL1P2 described himself as often wondering *"Why are you here"* and questioning *"…certain things in the Bible".* He said that, *"For me, I think being on the road, when I listen to music, I get time to zone out. Because I'm alone, I can actually think".* CL2P2 described enjoying *"reflecting on the day"*. CL2P3 noted, *"I had to reflect, and look at other things"* with CL2P4 saying, *"I rather think before I speak than just blurt things out".* CL2P5 described thinking as a way of living, *"I think all the time, and obviously through experiences I've learnt that sometimes friends would just want you for something, but not like there's always an agenda to something".* For CL2P6 this meant being analytical, *"I've always over-thought things, have been a bit of an over-analyst, and that kind of thing".* This linked to curiosity, *"Because of the curious nature that I have, and the understanding of things".* CL2P8 described her ability to think as an ability to look beyond judgment and move into acceptance, *"I think that's a big thing with coming from a religious aspect, people can be quite judgmental I think, or they can be very black and white. I just sort of look beyond that".*

They showed an interest to contemplate spirituality and religiosity, without commitment. CL2P1 described spirituality as influenced by surroundings, "*Remember, I think being spiritual also has a lot to do with your environment as well what's happening around you in the society you live in and the area you live in".* CL2P4 said, *"Ah, I'd say I'm trying to find my spiritual side. At the moment, I'm feeling kind of anti-organised religion and all those rituals".* CL2P3 was between spaces of religiosity, *"I wouldn't say I'm religious, but I do believe that there is a higher power and I don't know to what extent I would say 'Now, I'm Christian'".* CL2P5 said, *"I will pray, I will observe the fast, and I will go every so often, but, I'm not a devotee where I attend Friday prayers every single week, ... I think I'm not too sure because I don't know the basics of our religion".* CL2P7 described herself as liberal, *"I'm Muslim. So, my upbringing was sort of religious but liberal at the same time, so sort of not, what's the word, not very strict".* Whereas CL2P8 described herself as spiritual, *"I am very spiritual. I find my religious beliefs not, again I don't think one can describe it as religious, but I find my religion to be a way of life".*

5.3.3 Nature as blurred category

This typology observes rather than participates, therefore their relationship with nature is blurred. They spontaneously refer to nature as human nature (general characteristics of humankind), to nature as the environment, to nature as invisible/spiritual/intangible/an experience, or the act of observing nature through a window/unable to relate. They describe observing what is wrong in the world but feeling paralysed because of collective inaction. Furthemore, the importance of knowledge extends into their belief that knowledge will preserve nature. Since they are observers and they see nature as blurred, they tend to have a blurred relationship with animals. This blurring is experienced as tensions in that

they feel that social and cultural norms need to be used as a personal guide but at the same time they think that these social and cultural norms need to be challenged.

5.3.3.1 Functional pillar: Nature as blurred

This typology has a confusing relationship with nature that forms a functional pillar. The way in which they describe nature is often human centric and suggests it is difficult for them to relate to nature. For them nature is human nature which relates to their close relationship they have with some people and therefore suggests that nature to them is a human-centric concept. Nature as environment suggests nature as not only something created by humans but something that is broad and perhaps difficult to form an emotional connection with, as it becomes a space in which they live their lives. They do not describe place attachment in this context. They also tend to describe nature as something invisible or intangible, in some instances suggesting some struggle to relate or something that is seen through a window but not felt. Their observational tendencies mean nature can be different things depending on how they shift and shape their perception.

Nature is blurred dimensions

- ➔ Nature as human nature
- ➔ Nature as environment
- ➔ Nature as invisible/intangible
- ➔ Looking at nature through window/unable to relate

Figure 42: Nature is blurred category functional pillar dimensions A

Nature was described as a human-centric construct for this typology. When asked about nature they spontaneously thought about nature in relation to humans i.e. human nature. This became confusing for them, how can humans, who are natural, create something that is unnatural like climate change? Therefore, climate change was also natural. CL1P1 described nature as, *"If you have, say, a brother who is always naughty, you hear people say 'ag, that's his nature; he's lazy'"* or *"… because of the differences in religion, maybe a Muslim would say 'As a Christian, it's in their nature to be like this.' It is not what is tangible to the eye. It* (nature) *is a perception".* CL2P3 continued, *"… a person will say 'It's not in my nature to do that', but then the environment will be where it's, just, the things that are around you. Well, it's things that are around you that affect you, but nature is something that is in you".* Similarly, CL2P4 noted, *"I saw some interesting things in that hotel industry, and I saw some nasty signs of human nature too".* CL2P6 spoke of humans as nature, *"Like, what makes humans … I cannot understand what makes humans the sort of beings that make things unnatural? Because, like we are natural beings, as well".*

This typology said that they did not spend much time in wild nature; therefore, they described nature as their direct environment. It meant that nature could include human-made objects like buildings. CL2P7 described, *"… like the ocean, parks, and forests, even just the outside park, a normal park, a suburban park is what I would consider nature".* CL2P1 said, *"It* (nature) *is what's happening with the environment*

around me, which includes, obviously the natural environment, humans, organisations..." he noted further, *"My view is, I think there's no such thing as Mother Nature. We just have the environment".* CL2P3 struggled to differentiate between the environment and nature, *"… it has to do with the environment around but it's nature still".* CL2P5 said, "*I believe it to be true that trying to preserve things and trying to like protect the environment is important because it's going to impact the future population...".* CL2P8 related to nature as a built environment, *"There was not a human being that built it but not that human beings built wrong. Human beings have also done a lot. It is not a person's idea. It is there, it is natural, and that I love".*

Nature was described as intangible. CL2P1 said, *"What I'm saying is you have the environment, which is everything around us, but I think nature cuts across the environment and what is actually spiritual as well, or intangible, you can't see it, or you can't touch it".* CL2P5 said you can *"feel"* but not see nature. CL2P6 struggled to define nature, *"What is nature? I'd say nature is something that … It's a question I've been, like I've always had this thing that I couldn't understand where you draw the line between something being natural, and synthesised? I couldn't understand that, because it's a very blurred line".* He continued, *"I see nature as being something that was, well, not manipulated by society, by humans. But, at what point does something become unnatural?"* CL2P8 said that nature is everything, *"Everything that God created is nature although we are different from the animals and the sea".* CL2P1 noted, *"I think what the eye sees is more environment. Nature can include the environment, but it is more. It is what you feel, what you perceive. I don't know about the actual definition, but it's greater".* CL2P6 said, "*Yes, because I've never really thought of nature as a being. I've always thought of it as an entity, just a thing with which we live".*

For this typology, nature was something that is 'out there' and unrelatable. CL2P2 said, *"…I feel more connected to nature when I'm there* (away in the bush) *than when I'm in the city".* That makes relating to nature is difficult, *"I'm not sure how to relate with nature on a personal level"* (CL2P6). The environment makes nature unrelatable, "*I feel that the world is choking on the smog that we as people are producing, and it affects everything from the kids, to our own health, to nature. It even affects architecture, especially the sort of more sensitive buildings. Sometimes, I don't see the beauty in my surroundings because all I see is clutter, pollution, and sort of chaos"* (CL2P7*).* CL2P5 described forgetting nature, *"Sometimes not, because I think you are so busy and so cooped up, sometimes in just a room, or in just a household that you kind of forget what's out there".* CL2P4 said *"I never go to the beach now that I live here. I can walk to the beach from my house. [X] has its own beaches".* CL2P3 said the struggle to describe nature is a consequence of not spending time with nature, "*I think maybe it's more because we don't really spend as much time out there to try and understand ourselves out there. I think that's why it's so difficult to explain".*

5.3.3.2 Functional pillar: Relationship with animals blurred

Their blurred relationship with nature affects their relationship with animals and is therefore also a functional pillar. The "nature" and "animals" categories could not be merged since the emerging dimensions were different. Whereas their blurred relationship with nature hangs on human-centricity

and unrelatedness, their relationship with animals shows a paradoxical sentiment. This typology values conformity and therefore their natural instincts are to want to follow social and cultural norms as a guide when it comes to animals. These norms include eating animals, pigs are dirty, and snakes are associated with witchcraft. At the same time, they challenge these social and cultural norms.

Relationship with animals contrasted/blurred dimensions

- ➔ Social and cultural norms as a guide
- ➔ Challenging social and cultural norms

Figure 43: Nature is blurred category functional pillar dimensions B

Collective norms emerged as shaping part of their relationship with animals. CL2P1 spoke about using domesticated animals for profit, *"You find people actually breeding farm animals just to put bread on the table so they will sell off animals so they can pay for their expenses".* There was the perception that animals should be hunted, *"I think if that was not happening then the environment, the world, would be over-crowded"* (CL2P2). Animals were perceived as food or products, *"Well, to give life for human consumption most often"* (CL2P3). CL2P4 continued, "*To breed them for their products that they make or for their meat".* CL2P6 said, "*Well, like, I stay in res, and getting food, even now, is not the easiest thing. If a bit of meat comes my way, I'm not going to say no. And also steak just tastes so good".* For CL2P5 animals had cultural meaning, *"In my culture, I can't eat beef, it's symbolic of the cow. The cow is symbolic in our religion".* Furthermore, CL2P2 associated snakes with witchcraft, "*With us, if you see a snake, its witchcraft all the time",* and CL2P8 said, *"In our religion pigs are not allowed".* Overall, social and cultural norms provided justification for their relationship with animals, *"Eating animals is an accepted form of living, it is not something that is frowned upon"* (CL2P8).

Although they subscribed to norms, they experienced ideological tension. CL2P2 narrated, *"I will show you a picture of this massive snake my cousin found in her house one time, about two weeks ago, and she killed it. I was like 'Why kill it? Just run and leave it. It will go away".* CL2P4 said, *"Well, there was this whole move called 'Meatless Mondays' a couple of years ago. I was never really part of that because inside I feel vegetarian, even though I do actually eat meat".* CL2P2 continued, *"For me, as much as I drink milk, I feel guilty, sometimes. I'm taking something from someone".* CL2P4 also said, *"At some point I might well still change over because there's part of me that's horrified at seeing a chicken's leg".* CL2P5 described the tension, *"It's just so hard because like a part of me hates eating something that was alive, but then you also get information that humans need it to sustain themselves and it's okay".* Using animals for non-basic needs emerged as a concern, *"So, I did see that her fur was responsibly grown, but I don't know what that means really. So, that's not really a need"* (CL2P7). CL2P2 agreed, *"I really get affected by fur coats. To think that someone is now wearing that and has spent so much money on that".*

5.3.3.3 Micro condition: Paralysed by conformity

Although conformity is important, it also influences the context in which they operate in the world and is therefore a micro condition. This property emerged as this typology takes note of collective problems but also individual challenges in addressing issues. The contrasts between collective issues and individual responsibility, leaves them feeling paralysed.

Paralysed by conformity dimensions

- ➔ Collective problems
- ➔ Individual challenges

Figure 44: Nature is blurred category micro condition dimensions

Collective problems were issues that affect humanity as a whole. *"… the feelings I have are all negative. It's negative feelings. It's obviously fear, you're worried. I don't think the negative feelings are personal in nature"* (CL2P1). CL2P2 described humanity as harming nature, but individually there was no harm being caused, "*Like nature is harmless and we harm nature when it's not doing anything to us".* CL2P3 spoke of collectively addressing environmental problems, *"We need to do our part, and I suppose plant a tree, take care of each other".* CL2P4 went as far as to say that collectively humans were dangerous, *"I mean I've seen lately theories indicating that we may be something else, … the more dangerous of the animals on the planet".* CL2P5 noted, *"It's man trying to destroy things by pulling out the roots, there's pollution on top and it's all on mankind".* CL2P6 spoke about collective conformity, *"Well there has to be a sort of unity, I believe. Like, if you want to feel something with nature, it would be quite destructive to feel something against the way of nature. So, like, I mean we all conform to everything that we design, everything that we think of and everything that we do conforms to, umm, a standard set in place by nature by anything that is natural".*

Due to a collective compass, this typology struggled to see value in individual behavioural change. CL2P1 said, *"You can change your household but, in the greater scheme of things, does it really make a difference?".* CL2P3 noted, *"Everyone is responsible. I don't think one person can do all the work".* CL2P2 said, "*I said 'we really need to do something, or else it's going to get worse'".* CL2P5 pinned the blame on the collective, "*Like, there's always a fear that because of destruction and because of over-population, even I just feel that we're making, we're not preserving, or doing enough for it. So, I do feel there's going to come a time where even earth itself won't be sustainable".* CL2P6 suggested that collective behaviour is mandatory, *"I've heard a lot of those arguments and I can't say I agree or disagree with them. It definitely seems to me a cruel industry. It seems to me a very polluting industry and it's something that I definitely would not want to support, but it's just something that due to practicality I kind of have to".* CL2P7 felt that her husband dampened her attempts, "*Because sometimes when I go through my spurts of wanting to recycle my husband will say 'Just chuck it away'".* For CL2P8, the availability of mass-produced products made it challenging to use natural products, *"If they tell us use vinegar and bicarb it is more natural, I would use that but in the end, I would still use the bought chemicals".*

5.3.3.4 Process: Nature dissolves tensions

This typology uses nature as a process to release tensions experienced by the need to conform and feelings of being behaviourally stunted. They do not spend much time in nature and would often describe themselves as "not having a green thumb" or being more "interested in human-made elements", but they do observe the value that nature offers in helping them to balance expectations from society and those they have of themselves. They see nature as providing an escape from conformity, in turn enabling self-expression. They cognitively connect with the associated benefits of nature, although they do not spend much time in nature.

Nature dissolves tensions dimensions

- ➔ Enables escape from conformity
- ➔ Enables balance
- ➔ Enables self

Figure 45: Nature is blurred category process dimensions A

The *Observer* saw nature as an enabler to escape expectations from society, even though they did not do it often. They saw nature as something that rejuvenates, provides freedom, allows for appreciation, generates memories and is authentic. CL2P1 said, *"It's also a process of just rejuvenating yourself as well and just getting geared up again for what is in front of you to be able to actually tackle that".* CL2P6 spoke of the ability to be authentic in nature, *"It's just a place that I could just let loose. You don't wear fancy clothes on the mountain".* CL2P3 described nature as an enabler, "*Like when you want time-out that's where I would go. A peace of mind, that clarity that you need to make decisions".* CL2P4 discussed the opportunity to appreciate nature but that his interests were more in human-made elements, *"I will give some appreciation, but I mean many of my interests are kind of man-made things rather than natural things".*

That meant that they used nature to negotiate tensions experienced. These tensions emerged from societal expectations and individual contemplation. Nature provided an example of reciprocity and they felt that nature is a form of support structure. *"Nature helps restore balance; I think from nature I would say it's about balance. It's about balance, a balance of relationships, a balance of interfaces"* (CL2P1). CL2P8 described how balance manifests functionally in nature, *"If you read the Koran, God created the mountains and the mountains are there for a purpose to stabilise the earth so that it doesn't float and things like that",* and humans are part of balance in nature, "*I don't think it would be balanced if we were not around, hey".* CL2P3 described nature as giving life and support, "*Yes, to give life and give support".* CL2P4 described the healing properties of nature, *"Plants. I'm very interested in like the healing properties of plants. That's a huge part of nature. I'm not someone who goes and works in the garden. I don't feel I've got a very green thumb. I really deeply appreciate all those gifts from the nature that the plant kingdom gives us".*

Therefore, nature functioned as an enabler for them because it released experienced tensions. Nature provided a safe space to collect thoughts and where you can be authentic without pressures to conform.

CL2P1 said, *"I think it just brings a sense of calmness with your inner self",* and CL2P3 noted, *"That I like the calmness of nature. That's where I actually feel that I can think and draw strength".* CL2P4 described being inspired by the stillness in nature, *"Wow! Shew! Maybe, an ability to be still and to be quiet because my real truth comes in when I'm still and quiet and maybe I get that from Buddhism and nature gives that to me and that's actually one of the biggest things nature gives to me just the feeling of tranquility".* Nature inspired CL2P6 to collect his thoughts, *"I think it gives me a place to collect my thoughts where if it's just me and all this beauty around me".* CL2P8 described nature as providing relaxation, *"I find relaxation going out and just sitting out by the sea or just outside and that could have been a purpose for that. Without it, it would be different".*

5.3.3.5 Process: Knowledge preserves nature

Due to the importance of knowledge for this typology, the process that emerges is that they believe that knowledge will preserve nature. They describe themselves as an educator in this role of knowledge creation and sharing. This is a challenging relationship to have with nature as they are aware of many things, but this does not necessarily translate into behaviour for them.

Knowledge preserves nature dimensions

- ➔ Educator
- ➔ Creating knowledge

Figure 46: Nature is blurred category process dimensions B

They perceived themselves as educators but realised that there is a gap in what they knew and their behaviour. CL2P2 stated, *"I think I must do more because honestly I'm not doing much for nature, and I know I'm educated".* CL2P4 said, *"I know Rudolf Steiner believes you should spend every day just being quiet in the presence of a plant. I could be doing that",* with CL2P7 noted that, *"I'm educating my kids about it but, I'm not necessarily doing it".* They spoke about teaching children about the value of nature, sharing knowledge in their own communities, as well as educating themselves. CL2P1 said, *"So, I fear that I also won't be able to teach my children how to treat nature, the environment actually around them, how to respect it as well".* CL2P2 spoke of educating the black community; *"I would want to educate black people because I think we as black people don't have much knowledge when it comes to nature itself".* CL2P5 spoke about self-education as a priority, *"I think the best way to give them my know-how would be educating oneself on the do's and the don'ts of the environment".*

They valued creating and receiving nature-based knowledge. CL2P5 described knowledge as preserving nature, "*So I suppose in this sense the responsibility of just preserving it all, because I always come back to preserving, because I always feel knowledge is preserving",* and how awareness has played a role in understanding, *"See, we also study or I'm also aware about recycling, the environment, and how it's affected mankind, climate change, and all of that. I suppose in some ways I try to do the bit I can but at the same time, like for me, I suppose knowledge is a priority".* CL2P6 gained awareness through documentaries, *"Watching documentaries. That's happened over time. There was the whole*

Hiroshima thing and Chernobyl. A guy went into, there's a village next to Chernobyl, and he went in there, he went through gates and stuff and he took pictures of that place as it is now. It was so interesting. Like he walked into this house and kids were playing Playstation, and it was like such an old Playstation that was on the table, like a Playstation 2. It was almost ancient". CL2P8 described generational knowledge sharing, *"…my mom-in-law used to come to [x] often and she always says that where we are in [x], just a bit further down, the sea was just there and I mean you cannot imagine it".*

5.3.5 Climate change contrasts category

The tensions experienced by this typology combined with their blurred relationships with the biosphere extend into their understanding and relationship with climate change.

5.3.5.1 Functional pillar: Contrasting ideas about climate change

The *Observer* struggles with tensions created by the need to conform to social rules and knowledge, their own observations and their desire to know more about perceived reality. The way in which these tensions are operationalised as a functional pillar is that they have contrasting ideas about climate change. They have the idea that climate change is natural versus that it is a broader long-term social issue. Since they value knowledge, they are influenced by the confusion caused by science-centered uncertainty communication and that creates an increased sense of collectively induced catatonia.

Contrasting ideas about climate change dimensions

- ➔ Climate change as a natural issue
- ➔ Climate change as a broader and more long-term social issue

Figure 47: Climate change contrasts category functional pillar dimensions

Climate change emerged as being a part of a natural cycle, an act of God, or part of evolution or sun expansion. CL2P1 said, *"Is this sanctioned? Obviously, based on my background, looking at the teachings, is our earth what was envisaged at the time when it was created?".* Similarly, CL2P2 noted, *"…I do think that when God created all this, He knew that this is what was going to happen…"* so climate change is punishment, *"I said 'God is punishing us for destroying what He has given us'...".* CL2P8 continued, *"The same question I would ask on whether this is due to a human being messing around with nature or is it purely an act of god".* CL2P3 said climate change is natural, *"Well, people say that it's all because of the factories that are being built and the pollution. I think that it's just evolution, not that it also doesn't contribute".* CL2P4 added, *"There was a biology teacher here once, she made me question this idea because she said 'Maybe, there's no such thing and maybe over thousands of years those variations in weather patterns would happen naturally anyway.' I don't know for sure if we've caused it...".* CL2P6 noted, *"I can agree like how over-use of nature would add to climate change, but I'm also of the view that like the world has gone through a lot of climate ups and climate downs. I mean we've gone through Ice Ages; we've gone through periods of time where the world has been insanely hot. So, like it's something that's going to happen. I think its part of the nature of this world".*

Climate change was seen as a broader, and long-term social issue. CL2P1 said, *"There are a lot of initiatives such as using solar panels, recycling your waste. You can change your household but in the greater scheme of things, does it really make a difference?".* CL2P2 said, *"If you go to the squatter camps in winter, and you just pass through, you don't go inside, and the people that are inside don't see what we see from the outside. … the smoke that was in the air was terrible and people opt for that because it's a cheaper way of keeping warm".* CL2P3 noted, *"Or maybe the people then in the rural areas will have a different perspective because they also have to plant their food and their crops".* CL2P4 mentioned socially constructed silence, "*If this is really a serious thing, and these are people with children that want there to be a planet for their children, then I think we should be talking about it a whole lot more".* There emerged a sense of climate change ignorance, "*But for me I think it's a very very difficult one, and no matter how much emphasis is put on this, I still think people are ignorant"* (CL2P2). Climate change impacts would be seen in the future according to CL2P5 who said, *"I do feel there's going to come a time where even earth itself won't be sustainable. Future generations will have to dress and behave differently with climate change. You're going to have to take the rising heat into account in terms of fashion, in terms of people".*

5.4 Typology 3: The Misunderstood

"I am very misunderstood, and that takes a huge toll on the way that I feel people see me, which is also very important" (CL3P4)

"People seeing colour, almost, like racism per se, but, it's colourism where people categorise you because of your colour pigment" (CL3P6)

"My dad was an alcoholic, verbally abusive, cheated a lot, and shot himself in front of me and my brother" (CL3P8)

5.4.1 The Misunderstood: Categories, Properties and Dimensions

The identity-inspired label that described this typology is *The Misunderstood*. There emerged three categories namely misunderstood, diminishing nature, and humans can be bad. They share experiences in which they were a victim and that generally makes them feel like the world is a bad place. They share this experience of victimhood with nature in that they feel that nature is constantly being augmented and that because of this, their relationship with nature is diminishing. Their diminishing relationship with nature suggests a misunderstood relationship in a way, because although they are emotionally connected, they feel the relationship is overwhelming, painful and unbalanced. Due to their sense of victimhood, climate change is often interpreted as a potentially traumatic event that reinforces their idea that humans are bad. Within these three categories, there emerged 12 properties with their associated dimensions. Figure 28 shows how each property plays a role in the typological system as a functional pillar, micro condition, macro condition, consequence, or process.

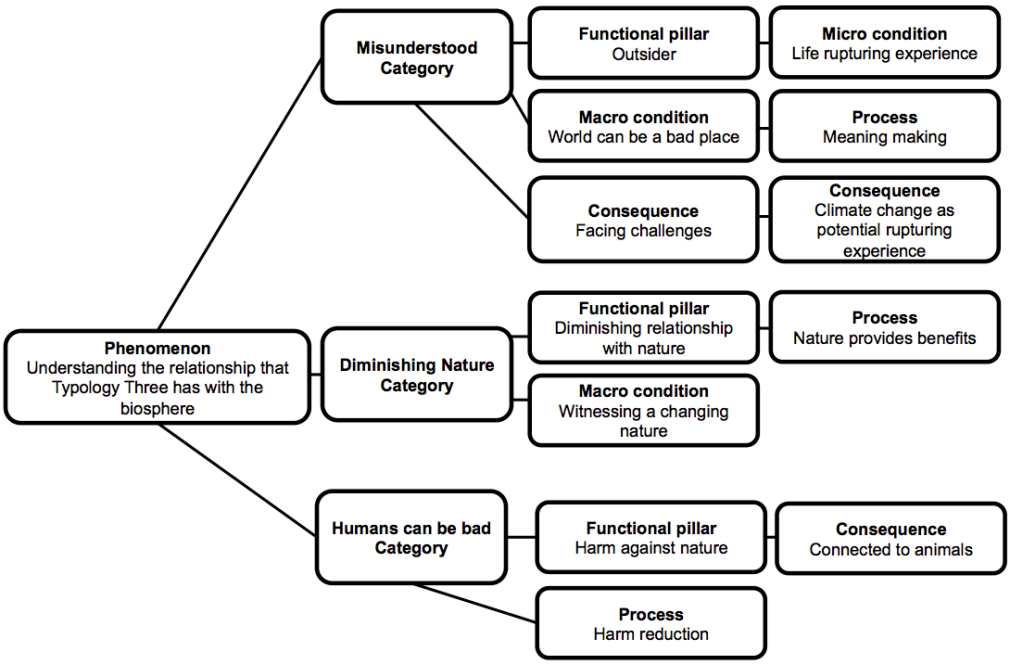


Figure 48: The theoretical structure for the Misunderstood typology showing categories and properties

5.4.2 The Misunderstood category

Being misunderstood is the experience of feeling that, although you have friends and family that the world often does not understand who you are. This typology feels like they are different, i.e. being LGBTI or vegan. Many of the participants in this typology shared rupturing life experiences that makes them feel like the world can be a bad place. One participant did not share a life rupturing experience but still described indirect ways in which life seemed ruptured to her. This means that there is a possibility that further threats or perceived negative experiences (such as climate change) might be seen as more rupturing as these function as positive feedback loops in a system that might already function in a victimised state. They describe having to face challenges of being different and attempt to make meaning out of experiences.

5.4.2.1 Functional pillar: Outsider

Feeling like an outsider is the functional pillar that described both an overt and covert worldview of the *Misunderstood*. They tend to see themselves as different to others and that even those they are close to do not always understand them. They describe feeling like an outsider when with family or during their childhood but also when compared to others they feel that they see the world differently. Being an outsider is different to being an observer, since an observer can observe from the outside, choosing to conform or to be separate. Examples of feeling like an outsider are being different to a sibling and then treated like an outsider after coming out as gay. They would describe themselves as loners or the ‘odd one out’ in the family. For some participants the experience of outsider-ship was more overt as is the case with a participant who had a coloured mother but a Greek father and grew up in a conservative white Afrikaans suburb.

Outsider dimensions

- ➔ Family/childhood
- ➔ Others

Figure 49: Misunderstood category functional pillar dimensions

They described feeling like outsiders from their family and for some during their childhood. CL3P1 described being different to his brother while growing up and after coming out as gay feeling a deeper sense of being an outsider. He said, *"I'm gay, so I came out and that obviously started an issue with him and his friends".* CL3P3 said, *"I did not like my brother and sister when I was a child…"* and CL3P5 said that, *"I wouldn't say that I'm like really close with my parents".* CL3P6 noted, *"I was just the odd one out".* CL3P2 explained feeling alone growing up, "…*in terms of fun, quite introverted even as a child, loner, read a lot".* CL3P7 described feelings of confusion, *"Like, I'm in a place where I don't really know where I'm going to, I don't really know who I am necessarily because I might be a friend to someone, I might be a daughter to my mom and dad, a sister to my brother and, also a sister to my cousin".* CL3P4 described feeling like an outsider as a child, *"I will never forget that, as children growing up, we were never really accepted by our coloured family in Cape Town, and we weren't really accepted by our white family here in Jo'burg".*

They also felt like outsiders when with non-family. CL3P4 described herself as an outsider from others, "*I've got a very weird way of looking at the world, it's very different. Most people don't identify with the way I feel, and the way I see things … it isolates me".* CL3P6 specifically described her experience as an outsider because of the colour of her skin society treats her differently, *"I'd, also eliminate that* (Colourism, discrimination based on shade of skin)*. I feel like that is because, like with the people I've come across, there's this yellow bone where people characterise you because you're a lot more yellow looking and then if you're a lot darker they call you 'dark bone'".* CL3P5 felt like an outsider because she is vegan, *"But I'm not like those typical vegans who tell everyone to go vegan. I don't do it".* CL3P1 admitted that although he felt like an outsider for being gay, he also felt like an outsider coming from a small town, *"So, I think the contrast between the two of those* (growing up in a small town and going to a city to go to university)*, and also the process, I think, of coming out, and being around people that are different like you, and different not like you, maybe the contrast between the two spurred it on".*

5.4.2.2 Micro condition: Life rupturing experience

Participants in this typology describe events that ruptured their lives. This is a micro condition in that it described a context relevant to the individuals' lives. These experiences are not related to abandonment but rather are a wounding experience that makes them feel different in the world. One participant in this typology did not overtly share a personal rupturing experience but described secondary rupturing experiences. These rupturing experiences, whether directly or indirectly, can be classified along the dimension of those associated with childhood versus adulthood.

Life rupturing experience dimensions

- ➔ Childhood
- ➔ Adulthood

Figure 50: Misunderstood category micro condition dimensions

They described single or multiple childhood ruptures. CL3P8 said, *"My dad was an alcoholic, verbally abusive, cheated a lot, and shot himself in front of me and my brother".* In addition, *"My dad once told me and my brother, two of the dogs had babies on the farm, and they couldn't grow up because they would catch sheep, … me and my brother were told to go and kill the puppies".* Furthermore, *"I had a puppy, and one of these puppies that I hid from my dad because he didn't want him, I called him X, and I would sneak him food and keep him in a little warm bed, … my dad found out about him. He called me over, he picked him up, and he shot the puppy in front of me".* CL3P2 told of her mother dying in the arms of her father, *"I don't remember a lot of my childhood. Also, I lost my mom at quite a young age... I went completely went off the rails from that".* Her father turned into an alcoholic, *"… he definitely drank way too much and I think he was just deeply unhappy, and I just wish that he had had an opportunity to break that cycle".* CL3P4 said, *"So, he* (alcoholic father) *was not an easy person to live with, but he was our dad",* and having children at a very young age she continued to say was challenging, *"I do, and I am young, and I had my children young".* She was also bullied in school, *"We, actually, felt like they were the victims of being pathetic, and racist".*

Some also had these experiences during adulthood. CL3P1 described the challenges of coming out as gay, *"I only came out in my early 20s, so it was quite late. Obviously, then, you go through the rollercoaster of dealing with it, all the stages",* and that *"I've had therapy in terms of … simpling things down as a technique to avoid anxiety".* CL3P2 described turning into her alcoholic father during adulthood, which in itself was a rupturing experience, *"It's funny how we repeat the patterns of our parents and I ended up not like him, but worse".* CL3P4 described losing her father, *"In the same year that my little boy was born, which was 2012, it was my second year in my studies, my dad passed away. In that sense our lives fell apart for like a year".* CL3P6 talked about mental illness experienced during adulthood, "*I think I'd get depressed because I've envisioned so much better for myself".* CL3P7 told a story of being a victim of crime, *"So, the first time I was with my friend, and we were walking and, then, about four guys came in, and they had knives, with them, and they said that we must just hand them our handbags".*

5.4.2.3 Macro condition: World can be a bad place

Within the context of South Africa, the property 'the world can be a bad place', forms a macro condition because of its broad scope and possible impact. Due to their rupturing experiences and feeling like an outsider this typology has a view that the world has the potential to be a bad place and that they have directly or indirectly experienced the way in which the world is a bad place. They describe the world as bad place relating to both environmental and human issues.

World can be a bad place dimensions

- ➔ Environmental issues
- ➔ Human issues

Figure 51: Misunderstood category macro condition dimensions

Environmental issues mentioned were irreversible nuclear disasters, animal abuse, and destruction for profit. CL3P1 said, *"My biggest fear, now, is large scale, what's the words, 'nuclear disaster', climate change irreversible. It's those larger things that are external, to me. Like, I'm not worried about myself as much as I am as about the world".* CL3P2 said, *"And since then I've just become so much more aware of everything, from water – it's another thing I'm so critical about, I'm very, very water conscious - and just the fact that it seems that we are hell-bent on destroying our planet but at a rapid rate".* CL3P5 extended destructive concerns to how animals are treated, *"One of the things I wish I could change is how people treat animals. I'd make everyone go vegan so nobody's eating animals anymore".* CL3P2 specifically used palm oil as an example of an environmental issue, *"You can monitor your food to a certain extent, but it's in shampoos, it's in creams, it's everywhere and people have got no flippin' clue. Really, you can put a man onto bloody Mars, are you telling me we cannot synthesize this?".*

Human issues mentioned were propaganda, impulsiveness, racism, drug abuse, and traumatic childhoods. CL3P7 said: *"…everything around me just tells me 'like, if there is a God out there, you are going to beg me for forgiveness because this is bullshit what's happening out here'".* CL3P8 continued, *"Like, I currently work at one of the shelters in X. So, I have a constant client base there because there is a big problem with drugs with the street people".* CL3P5 noted, *"It made a huge difference* (becoming vegan), *like I'm a lot more negative...about people because like my family isn't so they're obviously still* (non vegan) *...".* Whereas CL3P6 said, *"… at some point in my life I'd like to advocate for people".* CL3P2 was concerned, *"… I think if more people are aware and realise the gravity of the situation... and I think we're actually on the precipice of something drastic".* CL3P1 mentioned ignorance, *"Umm, I think, probably, a way to get accurate information to people, like to everybody, so that everybody gets on the same page in terms of understanding different types of concepts, and how things really are versus propaganda versus misinformation versus ignorance, and that sort of thing, because I think ignorance is a big thing".*

5.4.2.4 Process: Meaning making

In order to deal with their experiences this typology engages in a constant process of searching for meaning through suffering. They do this through forming strong opinions, introspection, making a difference, and self-value. This process is potentially an act of re-empowering the self in order to form a negative feedback loop to balance the system, which is currently in a state of negativity. Negative systems potentially struggle to function optimally in the world. They try to make meaning through searching for control and searching for resolution. These two dimensions operate complementarily as control is managing something and resolution is the process of setting something free.

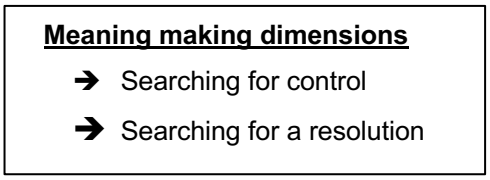


Figure 52: Misunderstood category process dimensions

This typology showed an attempt to be in control of their own thoughts, options, and making a difference. This need to take control might be an attempt to offset previous experiences in which they felt they had no control. CL3P8 said, *"I try to always seem really in control, and nothing phases me".* CL3P1 added, *"Yes, excluding things that I'm not in control of, having an internal locus of control versus external influence".* CL3P3 described the process of taking control through the process of introspection, *"I've always been fairly introspective. If I was going to do another qualification, one of the things that would definitely appeal to me is something like the psychologies, or the sociologies, and philosophies".* CL3P4 called to God to help find control and meaning, *"… I'm totally non-religious, but deep down inside me, I seek God every day".* CL3P5 described a process of seeking control through gaining meaning and understanding, *"Like, I think that I'm an intelligent, logical person, so I always want to understand how things work. I won't just accept what I see. I want to know why. That's also with psychology, I like to know why people do what they do. So, I always want to find out more and understand it and get to the reasoning behind it".*

Searching for a resolution included releasing through acknowledgment of the source of conflicts, grappling with internal struggles, and contemplation. CL3P8 said the way in which she searches for a resolution is through the process of acceptance of what happened during her childhood, *"I think it's just learning to accept that what happened did have an impact on me"*. CL3P2 described struggling with ethical contradictions, *"So I have this constant struggle. Then one day I was saying to my boss, you know, can you believe what they're doing? And she said, very correctly, if you look for a client that wasn't doing something* (unethical) *we wouldn't have any clients – and that's the reality, and it's true".* However, she still felt a sense of guilt that even her own behaviour does not match her ethical beliefs, *"Yes. But I am ashamed that my behaviours don't actually always mirror my mind-set".* CL3P4 explained her resolution about religion, *"I feel like religion transfers the correct belief system, that's the wrong word, morals, maybe, values, things that are important. Some people can't fathom those ideas without religion. I can still be humane and not religious".*

5.4.2.5 Consequence: Facing challenges

Due to the experiences this typology has had and the fact that they see the world as potentially a bad place, they attempt facing their challenges as a consequence. The two dimensions are acknowledging the experience of entrapment in life and the emotional responses when dealing with these challenges.

Facing challenges dimensions

- ➔ Acknowledgement of entrapment
- ➔ Dealing with challenges

Figure 53: Misunderstood category consequence dimensions A

Acknowledgement of entrapment was the process of countering denial. This typology had no choice but to acknowledge the impact their experiences have had on how they see and operate in the world. CL3P2 described a fear of stagnation, "*You know, my biggest fear is that I'm sitting in exactly the same place and unless I take drastic steps, that's probably what it's going to be like".* CL3P3 talked about feeling trapped, *"Often I feel like I can't necessarily do what I want to do, or the circumstances don't allow me".* CL3P4 also spoke about situations of self-entrapment through falling pregnant and having to work at the cost of her dream to become a teacher, *"I had to leave university to, now, actually look after my own kids"* she continued, *"That's just pathetic* (her job), *but that is not me. It puts food on the table, so definitely, it's important, and I respect it, it's my work, but I have to get my Degree, so I can teach".* CL3P5 described having to stay in a University residence that caused him stress, *"Yeah, I was in res for the first 2½ years and I hated it".* CL3P3 described feeling trapped in a game where you only have one life, *"I suppose, I'd like to think that if we played it again, we could be smarter. It's kind of like a computer game".*

The typology described expressions of fear when dealing with challenges. CL3P2 described her personality as *"fearful"* and CL3P3 adds to this, *"I do take some risks, but I suppose I like it to be the calculated risks. Probably* (fear*), being out of control".* CL3P6 also described a fearful approach to life, *"In life, I guess, I'd fear not accomplishing, or achieving the dreams that I have".* CL3P4 feared losing a child, *"…one of my children dying. Having been at a child's funeral, and watching what the mothers go through, please God, don't let that happen to me".* CL3P5 said, *"But I guess like being a failure and not achieving what I want, just like wasting my life".* CL3P7 described a fear of others, *"I guess, I'm intimidated easily. For example, if we're in a group, and we're talking about current 'fees must fall', stuff like that, I generally wouldn't make an opinion, or have comments about it, unles, somebody asks me 'What do you think?' and then that's when I speak".* CL3P8 described how she reacts to fear with fight rather than flight, *"So, I learnt from very small if you're in a situation that is threatening to you, some people flight, but others fight".*

5.4.2.6 Consequence: Climate change as a potential rupturing experience

This typology is geared towards identifying potential rupturing experiences as a consequence of their history with rupturing experiences. Climate change spontaneously triggers concerns for this typology. They express negative psychological emotions such as helplessness, fear, sadness and anxiety associated with climate change. They also express concern about the collective impact climate change might have. Some feel like they play an insignificant role in climate change.

Climate change as a potential rupturing experience dimensions

- ➔ Psychological impact
- ➔ Collective impact
- ➔ Insignificant impact

Figure 54: Misunderstood category consequence dimensions B

Climate change spontaneously triggered a range of psychological responses. They described upsetting scenes such as a skinny polar bear, confusion about what is important, sadness, anxiety, frustration, a sense of helplessness, isolation, feeling terrified, and even frustration. CL3P2 said, "*Ooh! Problems. Big problems!".* CL3P5 noted, *"… like the rising temperatures and so we've just had that drought, like we literally just had the rain last night here, but yeah, it's droughts and less rainfall and the melting ice cap is like... that makes me really sad, so you see the photos of a polar bear just drifting there, I hate that stuff".* CL3P8 agreed, *"Sad. It's very sad. Like, we see the media pictures of climate change where you see this poor little skinny ice bear standing on a melting piece of ice and it's going to die because the next piece of ice is too far away".* CL3P3 described "End of days" imagery, *"I suppose, in my mind I'm kind of seeing, I was going to say the end of the world, but I don't necessarily mean the end of the world".* CL3P1 described feeling solitary, *"Umm, helplessness, but, that's a bit much. Essentially, isolated and feeling like I can't make a change necessarily on my own, so isolation".*

They associated climate change with the decline of civilisation, wars for water, food insecurity, and an unlivable earth. CL3P8 said, *"I always said if the Third World War hits, or anything hectic in this world, I'm just going home. I will just go to Calvinia. It's on a plateau, no one knows it's there".* CL3P1 described, *"… about the overall decline and destruction of civilisation based on ignoring things like climate change and external factors and, maybe, … over-population".* CL3P2 described war-like scenes, "*If it's between you and me and fresh drinking water, people will take each other out because we need water to survive".* CL3P3 said, *"…we're now talking a substantial portion of the world* (has water insecurity) *which means there actually, literally, isn't enough food to go around, possibly, in the world as a whole, or in a big enough area that it's hard to transport because I see that ultimately resulting, basically, in a break-down of civil order".* CL3P6 agreed, *"…we are running out of water",* and CL3P7 noted, *"so, eventually, they wouldn't be able to live on earth".* CL3P4 believed, *"Obviously, it will be too late for us, not for the earth, it will be too late for us, like as humans, and maybe donkeys and stuff".*

They felt insignificant in their role causing or changing the fate of climate change. CL3P3 said, *"On the one hand, if I think about myself in the bigger scheme of things in the world, I'm so small that it's insignificant, and it doesn't matter, and maybe there's an element of, are you doing that so your problems don't matter?".* CL3P7 said, *"We know that we've been depleting our resources, like insanely, and I don't think I have any personal vendetta in order to be able to combat that* (or) *to stop that or help in a way, to preserve our planet".* CL3P4 said similarly, *"It's quite out of our control".* CL3P3 continued to describe a sense of powerlessness saying, "…*and, I suppose there are two things: one, well, if I stop doing it, it's not actually going to make any difference because it's too small to matter…"* and because of collective

wrongdoing it is very difficult to change the way the world is going since *"ultimately our fates are tied together"* (CL3P3).

5.4.3 Diminishing nature category

The *Misunderstood* typology shares the experience of victimhood with nature. They have an emotional connection to nature and acknowledge the benefits of nature. However, although they feel affect they tend to avoid physical connection or immersion in nature because it is painful. They also feel powerless against humanity and against themselves to make a difference and therefore their relationship with nature is diminishing. They are witnesses to the changes in nature and that evokes negative emotional responses. They perceive nature as being victimized, and therefore they feel negative towards humans and perceive the world to be a bad place.

5.4.3.1 Functional pillar: Diminishing relationship with nature

The *Misunderstood* typology has a diminishing relationship with nature that operates as a functional pillar. Their diminishing relationship with nature suggests a misunderstood relationship in a way, because although they are emotionally connected to nature (based on the quantitative results), they find the relationship overwhelming, painful and unbalanced. They describe being witnesses to a changing nature, yet unequipped to make a difference. This means that the relationship is painful and in order to process this pain their affective connection is experiencing diminishment.

Diminishing relationship with nature dimensions

- ➔ Unequipped to make a difference
- ➔ Painful relationship
- ➔ Fading emotional connection with nature

Figure 55: Diminishing nature category functional pillar dimensions

They generally felt unequipped to make a difference. CL3P2 described overwhelm, *"So I can do small things, but I know that it's not having a big impact on the global things … it's almost easier to just go, you know what, stuff it".* CL3P1 agreed, *"There's a lot going on there, but it wouldn't be enough for an individual, like myself, to make any difference in that picture, … unless I tie myself to a tree".* CL3P3 felt insignificant, *"On the one hand, if I think about myself in the bigger scheme of things in the world, I'm so small that it's insignificant, …".* CL3P4 also noted that, *"I think in terms of perspective, I kind of know how little I am here. I mean I am only a drop in the ocean".* Others described a lack of time, *"I'd be like those tree huggers – I would hug trees, and I would like try and save every little pig out there. But, firstly, you don't have time. I mean, when do you actually have time to go and fight for the rights of animals?"* and, *"I don't think I have enough hours in a day. I think, right now, it's just extremely hectic with my Masters research, and everything like that".* CL3P5 described a lack of motivation, *"Well, like sometimes if I'm lazy I don't recycle that well, so that's something that I worry about and I walk everywhere that I can".*

Their relationship with nature is painful as they described bearing witness to destruction and feeling guilty. CL3P1 described having grown up next to destruction, *"Anyway, where I grew up, there was a factory with lots and lots of different huge trees, and lots and lots of different smoke and steam coming off it, literally next to the forest which they cut down".* CL3P4 noted, "*My relationship with nature is obviously not ideal, but, umm, so I fall under that human destroyer category because I destroy nature".* She continued, *"So, I mean like, like, I said to you I make excuses. I'm very bad. I buy meat from wherever. I don't buy free-range chickens. I refuse to spend that amount. I mean, you're not feeding the damn thing anything special. But I think I would definitely want to do more to help animals, help nature, but also, my hands are tied in many ways because I don't have the means to, which is sad. It always comes down to money. It's pathetic. What a life!"*. CL3P5 noted that, *"The world would be better without people".* CL3P8 shared a story that haunts her, *"On a Sunday, I would walk around with a gun, and we would hunt the birds in the fruit orchards. I learnt to shoot at like six, seven years old, and I would go and hunt birds".*

Their affective relationship with nature was described as being in decline. CL3P1 said, *"Less, and less, no* (connected to nature)*. I think there is the link there, obviously, that we cannot survive without it, so we cannot avoid the connection. I'd say it depends on the individual, and their specific situation whether they are literally part of nature or not, and separate it from it…But largely* (myself), *probably not".* CL3P2 noted, *"Don't think actually humans have anything in common with nature"* and *"Not often, hey* (out in nature)*. Not often enough. In fact, I'm terrible. My garden's like dead from the drought. I've got not a green thumb".* CL3P3 described a distance, *"But, I suppose what I'm looking at is almost the distance from nature. So, it's there and I can see it, but I don't really get to experience it properly".* CL3P4 said, *"I don't even know what my relationship with nature is".* CL3P7 similarly noted, *"I don't really think I have a relationship with nature. It's like, I do believe that the trees and plants and grass and animals are living things, just like we are, but I wouldn't say I have a connection to them". CL3P8* who lives on the beach but never walks on it because it makes her feel sad, said, *"Looking at nature, but you're not actually involved".*

5.4.3.2 Macro condition: Witnessing a changing nature

The witnessing of a changing nature is something that might be relevant to broader society and is therefore a macro condition. This typology spoke of a nature that is self-reliant, yet being drastically augmented by humanity. Their emotions and the way in which they perceive themselves suggests that they are bearing witness to the collective loss being experienced as nature is destroyed. Nature is perceived as strong and independent, yet humanity is making nature less pure.

Witnessing a changing nature dimensions

- ➔ Nature as self-reliant
- ➔ Nature as augmented

Figure 56: Diminishing nature category macro condition dimensions

This typology saw nature as self-reliant (pure). CL3P3 described nature as non-reliant, *"I don't know. I don't know... maybe an understanding that I'm reliant on nature, but nature is not reliant on me".* This sentiment is confirmed by CL3P2 who said, *"Nature doesn't need humans to thrive"* and also CL3P4 said, *"Nature looks after itself. Nobody needs to look after nature, and anything that damages nature will eventually be, nature will work it out".* CL3P6 also described the purity and independence of nature as, *"I think their purpose would be to show that anything is possible because wild animals fend for themselves. So, I guess that's their purpose".* Nature is also described by CL3P3 as harsh*, "Again, I think, for the animals and the individuals involved, it's not so much fun because nature is quite harsh. It's the eat or be eaten".* Yet, nature is seen as independent of people, *"I guess it's more sort of like I don't want to take over, like I'm happy just in myself and to me nature's the same, like it's not trying to take over people, it's just there, you know, on its own"* (CL3P5).

This typology described witnessing nature being changed (i.e. impure nature) that means it is becoming less authentic. CL3P1 said, *"I just think of it as something … that's uninfluenced, and that is under-estimated in terms of its fragility, … but, …it could be quite easily influenced".* CL3P2 described, *"Industrial raping. If you had to cut open this whale or whatever it is, you'll probably get all the plastic inside, which is the new thing that I'm freaking out about".* CL3P1 talked about nature being curated, *"…there's nothing going on in there* (commercial forest) *besides when they come to chop down the trees, necessarily. It's like augmented nature or been manipulated".* CL3P3 added to the idea of nature being impure by saying, *"I think my view of the world is, I suppose, it started out as nature, and we kind of gradually converted it if you like".* CL3P7 talked about changes, *"Well, climate change to me basically, it would be like our climate is changing due to the changes that we've made to the earth".* CL3P3 described the rationale for making pure nature impure: *"… I think one of the strengths of humans is that we're able to manipulate nature to make it more comfortable for us, and to make things nice because pure nature is very uncomfortable".*

5.4.3.3 Process: Nature provides benefits

Although this typology experiences a changing relationship with nature, they process this change through looking at the benefits that nature provides. Even though they mention benefits, they are unlikely to spend time outdoors because they feel emotional pain related to nature when being in nature. They see nature as providing biological or survival benefits to humanity, as well as experiential or spiritual benefits.

Nature provides benefits dimensions

- ➔ Biological / survival
- ➔ Experiential / spiritual

Figure 57: Diminishing nature category process dimensions

Nature emerged as something that provides humans with physical benefits that assist with survival. This was the most basic relationship a typology could have with nature, but it showed perceived value. CL3P1

said, *"The basic human needs that we have in terms of literally oxygen, water, the ability to survive, in addition to those sort of core basic concepts, I think".* CL3P2 said, *"We have no oxygen without trees, we need access to rainwater, clean drinking water",* and "*nature gives me food, gives me sustenance. That's what it gives me".* CL3P5 agreed, *"Yeah, because without nature we wouldn't exist. I mean, like we need trees to make oxygen, that kind of stuff. Well, I live on vegetables and fruit, so they give me my food". CL3P8 said, "Umm, everything isn't it? Well, food anyway".* CL3P4 described this life source when she said, *"Well, nature is definitely the life source. I mean without it, we wouldn't be here"* Perhaps this suggests that they know that they are intricately dependent on nature and as nature diminishes so does their chance of survival.

Nature was also seen as providing emotional benefits such as having positive emotions, feelings of peace and serenity. CL3P6 said, *"I think the purpose of nature is, it's there to just bring out, not even to bring out, but, it's just there to evoke emotions of positivity".* Nature also allows a person to be authentic, *"Nature is peaceful surroundings that allows you to be yourself".* Other positive emotions associated with nature were, *"Yeah, I enjoy it, it makes me happy. But yeah, nature makes me calm"* (CL3P5). CL3P1 said, *"It gives variety in terms of exposure to so many different experiences, and so many different sights, sounds, and senses; relaxation and a sort of holistic human experience".* CL3P2 noted, *"Imagine standing here and just seeing those animals – they're so peaceful and beautiful".* CL3P3 acknowledged that nature provides an escape from stressful life experiences, "*Normally, if I get very stressed out at work, one of the things I'll do is, I will go out into the garden and I will plant plants, or dig. I think it's just that sense of, I suppose, contact with the earth, if you like, that actually helps. So, I think it's something that we need, and I think it's something that we should be experiencing".*

5.4.4 Humans are bad category

This typology is neither human- nor environmentally-centric. They describe having seen the harm humans cause to themselves, each other and to nature. They describe humans as living unsustainably and that because of this they describe feeling more connected to animals. Since they tend to be focused on the concept of harm, the process they use to deal with the world is through the concept of harm reduction.

5.4.4.1 Functional pillar: Harm against nature

This typology spoke of how they witness the harm being caused to nature because of the way humans live and behave and it forms the functional pillar. They describe the harm against nature as both collective (others) and individual (self).

Harm against nature dimensions

- ➔ Others
- ➔ Self

Figure 58: Humans are bad category functional pillar dimensions

Collective harm against nature included the tragedy of the commons, generalised abuse of nature such as pollution, and the guilt for what is happening collectively. CL3P3 explained, *"When we're talking about that pot, and those trade-offs, you can't necessarily have every individual trying to make that trade-off, because then you do end up with that tragedy of the commons, the commons, we were talking about with the over fishing".* CL3P5 noted, *"That's how I feel that nature should be respected – it was there long before us, we should do what we can to learn how to live with it and not abuse it".* CL3P6 spoke of short-term needs, *"But, because at that point, we're focused on the now, we do not realise that in the long-term it will affect us. We just need firewood for now".* CL3P7 said, *"So, I know about the ozone layer, we have holes in it, and it's due to the CFCs, like all the plastics and the resources that we have". CL3P2 noted, "We all are part of this planet, we should be co-existing. We're not". CL3P5* talked destruction*, "… it's how humans are destroying the world", and "I think that we're slowly wiping out our own race"* (CL3P7).

Individual harm against nature was pointing fingers at themselves. *"That the lifestyle that I have, and that most people have, or many people have is unsustainable"* (CL3P1). Driving a car was seen as a personal contribution to the destruction, *"Okay, probably the worst is the fuel, but aside from that I try and keep my footprint small, but I'm buying plastic that's getting dumped somewhere"* (CL3P2). CL3P3 added, *"Me driving my car now is kind of already done"* and *"I guess that's also a good thing but sometimes obviously when you have to drive then I know that's going to ruin the environment a bit, that kind of stuff"* (CL3P5). CL3P3 spoke of consumption of electricity, *"If you're watching TV, it's your electricity, and it's the TV that was made"* and CL3P4 spoke of consumption, *"I buy products that are not environmentally friendly. I kind of blank it out because I can't afford to eat ethically".* Additionally, *"Yes. I feel like me running the shower two minutes before I pop in is wasting water which initially will lead to some sort of climate change"* (CL3P6).

5.4.4.2 Consequence: Connected to animals

This typology spontaneously described feeling connected to animals as a consequence of the harm they witness being caused by humanity. They acknowledge their sentience, inherent value, and associate them with positive emotions. They are more conscious about the consumption of animals. They are aware of vegetarianism and some are moving towards eating plant-based food while others are already there. They also describe wanting to source natural products.

Connected to animals dimensions

- ➔ Connected
- ➔ Consumption

Figure 59: Humans are bad category consequence dimensions

The *Misunderstood* typology described feeling connected to animals. CL3P2 talked about the cruelty of dairy, *"But if they were just like happy, like grazing and uncle Joe or farmer Joe came with his bucket to milk the cow* (it would be different)*".* CL3P3 said, *"So, whether it be farm animals, whether it be farming, … I suppose they* (animals) *would like to believe they've got a different purpose than just being fed into*

a machine later on". CL3P4 continued, *"There's this massive industry where there's just this massive demand for meat. These animals are treated like, God it freaks me out to even think about it. We're cutting down forests to accommodate cows grazing, it's like pathetic actually".* Due to everything happening for the consumption of animals CL3P5 is a vegan and said, *"I think it's more for the animals. The world would be better without people".* CL3P7 described animals as sentient, *"Because, if they're animals, they're living things".* CL3P8 pointed out that the use of animal products is deeply engrained into our existence when she said, *"If I look around, everything in here, even the glue our shoes are made from comes from some poor horse's hoof".*

They described an awareness of how their consumption affects animals. CL3P1 has a vegetarian family member, *"…so I've been exposed to shifting away from cultivated animal meat...".* CL3P2 said, *"I've been on quite a mission lately where I'm trying to source products that are as natural as possible – and I failed miserably. I don't know if you every buy little ice-cream tubs and they come in those rings? So I like cut up those rings before I throw them away because I'm worried that birds are going to get like stuck through one of the rings".* CL3P3 noted, *"So, I'm not a vegetarian. There's a part of me that says I possibly should be".* CL3P4 said*, "But stopping to eat meat definitely helps, … but not with things like climate change"*. CL3P5 is vegan, *"But for me, like it's firstly to save the animals but then obviously I think it helps the environment as well, because like to grow a certain amount of like vegetables or whatever takes up far less land than to produce meat …"*. CL3P8 consciously consumes, *"Like, my friends would be very disgusted because I eat every part of an animal, but, I learnt to kill an animal when I was really tiny, and if you're going to take their life, you have to make it worth it".*

5.4.4.3 Process: Harm reduction

This typology described harm as unavoidable and reduction as the process used to reduce the amount of harm they are causing. This process also reduces negative feelings such as guilt and sadness. Harm reduction is an interesting concept as it allows people to feel empowered to make a difference, which is important especially for this typology, who can easily feel helpless. The harm reduction therefore forms a negative feedback loop in the typological system. The two dimensions for harm reduction are the idea of minimization and that of prevention.

Harm reduction dimensions

- ➔ Minimisation of harm caused
- ➔ Preventation of harm

Figure 60: Humans are bad category process dimensions

Harm reduction was described as the minimisation through making small changes, reducing waste, reducing damage and looking at eating habits. CL3P8 said, "*I do think telling people to stop won't work. You have to look at it as a harm reduction thing instead of drawing a line and saying, 'no more' because that's never going to happen*". CL3P5 continued that reducing the damage caused is important, "*I think everybody has a responsibility to do what they can to reduce the damage".* CL3P2 described harm

reduction as doing small things, "*So I can do small things, but I know that it's not having a big impact on the global things. You know what, for me it's all about baby steps and doing what I can differently in the areas that I'm prepared and where I can make a difference".* CL3P1 continued to say, "*I've sort of made small changes in terms of my choices therefrom, but, I'm not vegetarian, or vegan, or anything, yet".*

Prevention included saving water; choosing carefully what is consumed and ceasing the use of something like aerosol sprays. CL3P1 described prevention as a process of self-questioning, "*I think the main thing is not necessarily what do I contribute to nature? It's what I prevent in terms of negative consequences, that is the core thing, I'd say".* For CL3P2, prevention happens at the point of purchasing products and consuming resources, "*The biggest thing that I can do is save water as much as possible and buy products that aren't tested on animals".* CL3P7 also described prevention in consumption, "*So, it would be* (to) *stop using the aerosol sprays and try using a different format of deodorant and also not using that much paper, trying to limit that and sticking to using electronic things, like your computer".* CL3P8 described harm prevention in consumption choices when it comes to the age of the animal and the consumption of animal parts, "*I prefer to buy mutton which is an older sheep. I know that and that is why I will eat every single part. There's a piece of pig's skin in my freezer right now".*

5.5 Typology 4: The Hero

"I see myself as wanting to be that person, wanting to be the person that people can look up to and say 'I know she will help me', or 'there's somebody that we know we can depend upon'" (CL4P5)

"Like, in most of my community, people have HIV, and most of them are not actually taking the treatment, just because they're afraid that some other people actuall, know about their status, and all of that. So, all of that just motivated me to know more about HIV, why it's so difficult to find a vaccine, and why is it so complicated, why haven't they found a vaccine, till today. So, that's what actually motivated me, so that's why I'm doing research on HIV" (CL4P6)

5.5.1 The Hero: Categories, Properties and Dimensions

The identity-inspired label that described this typology is *The Hero*. Four categories emerged, namely hero, nurturer/peace keeper, people-centric, and impacted by climate change. This typology had an emerging theme of feeling compelled to be somebody that others can look up to and to make a difference. This need to make a difference and be a hero is in part how they obtain their sense of achievement and through leaving a legacy. A large part of the way in which this typology operates is functioning as nurturers or peacekeepers. Their worldview is human-centric which means that their interpretation of the world, nature, and climate change revolves around human-centered impacts and solutions such as technology. As humans, they feel impacted by climate change. Within the four categories, there emerged 13 properties with their associated dimensions. Figure 29 shows how each property plays a role in the typological system as a functional pillar, micro condition, macro condition, consequence, or process.

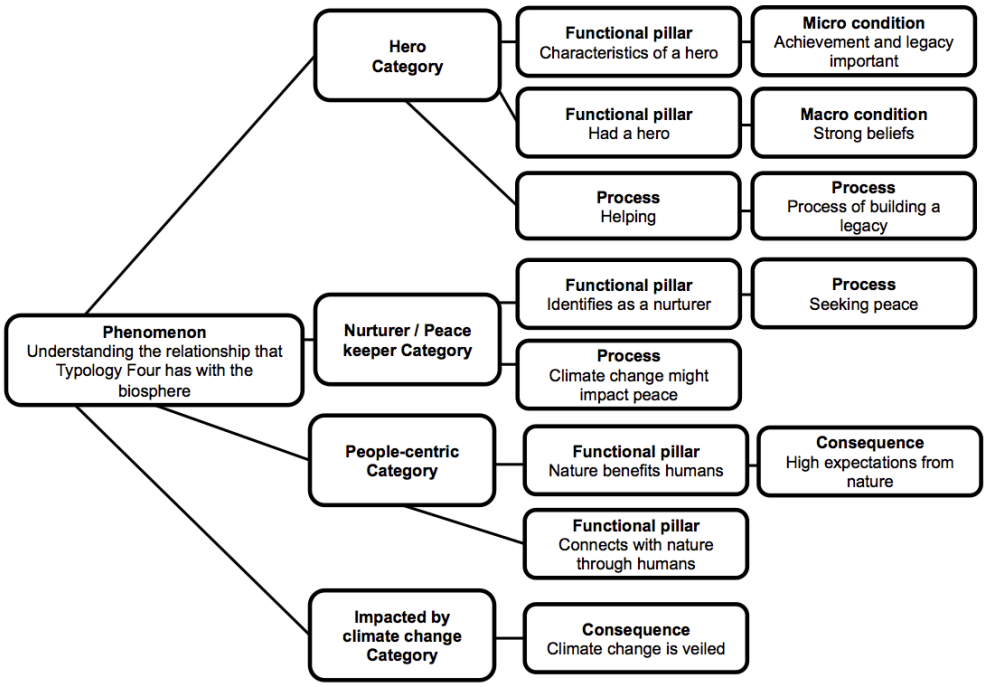


Figure 61: The theoretical structure for the Hero typology showing categories and properties

5.5.2 Hero category

The *Hero* typology feels a sense of achievement when others look up to them in the same way they looked up to their own heroes. They describe a range of characteristics a hero needs to have. A large part of being a hero is having the drive to leave a legacy by helping others. However, leaving a legacy takes time and effort, and there are various processes that emerge associated with legacy building. Part of being a hero is having unwavering belief systems.

5.5.2.1 Functional pillar: Characteristics of a hero

Characteristics of a hero is the functional pillar. They describe the characteristics of a hero as somebody who wants to make a difference but also wants to be seen doing that because it provides a sense of achievement. They talk about how their environments inspired them to become heroes and how they developed their drive to make a difference. Being a hero seems to be a calling for them even if only for their family. A hero has to have a strong sense of self.

Characteristics of a hero dimensions

- ➔ Moulded by environment to be a hero
- ➔ Driven to make a difference as a hero
- ➔ Strong sense of self

Figure 62: Hero category functional pillar dimensions A

Heroes described being moulded by their environment. CL4P3 described being inspired by the story of Sarafina who protested against apartheid language policies, *"In growing up, when I was at school, we*

started a drama team where we did traditional dance, and drama, and singing songs from Sarafina". CL4P5 said, *"We would come from school and us girls would wash out the socks, and our underwear we wore for the day. The boys would clean our school shoes. Today, children don't do that".* CL4P2 noted, *"You can ask anyone from the background that I was in not to say 'black', but, someone from rural areas, someone from the township, someone from a poor background, the main objective there is 'Get out of there'".* CL4P4 continued, *"Why it was like that was because our aspirations differed as we go. That's why I survived the issues of, you know sometimes you try out things, you smoke, you do this, you steal sugar there, you do this, but, I was not part of all of this but, it was a normal growth".* HIV/Aids inspired CL4P6, *"So, like you know when you're a child, and you see people die, and you never know why. When I started growing up, I started knowing"*.

Heroes emerged as being driven to make a difference. CL4P2 said, *"…but the solution is to bring that part of life, before Apartheid, to the minds of people…"* and, creating jobs, *"If you want to build a company, if you build it out of love, you know, these people that I'm employing do have families".* CL4P3 described social work as a calling, *"I didn't take it as a career* (social work)*, but as a calling, because if I needed a career, I would do IT. I could have done sound engineering, or any type of engineering as there was a lot of money there".* CL4P5 described how her drive to make a difference meant being criticised by her religious community when she wanted to start a Christmas market for the poorer kids in the community, *"I had a lot of 'flak' (sic) from the Muslim community because I was encouraging something that was not in my religion. I never did that. I never did anything similar in our religion to encourage Islam whereas I believe that what you do is inside of your heart".* CL4P8 said that in order to make a difference you need to be proactive and fearless, *"But I am also proactive. I do not have personal fears* [translated from Afrikaans]*".*

They described being a *Hero* as requiring a strong character. CL4P1 said, *"*(You have to be) *up-front, critical and understanding".* CL4P3 challenged the status quo, *"A lot of people will be coming for advice and stuff, but I remember one day when I was at primary school, I had three options. I wanted to be a traffic cop or a pilot or a social worker and I had never heard of male social workers by that time".* Similarly, CL4P4 described, *"But, what I want to do is, I was sitting and said 'I've done one, two, three. Now, why can't I pursue studies up to PhD?' Remember, PhD is not about a job. It's a passion, first of all".* CL4P5 noted, *"We started sowing sunflower seeds yesterday. I would bring bunches of sunflowers here every day. We should be the ones to water that garden and plant the seeds for tomorrow".* CL4P7 described strength, *"I could have moped around and said, 'my life was hard', but that's not what life is about. So, you've got to put your big girl panties on and carry on".* CL4P8 said, *"People have, even me, the ability to achieve so much more, but the choices that I make every day allows me to move forward or makes me stagnate* [translated from Afrikaans]*".*

5.5.2.2 Functional pillar: Had a hero

Another important pillar for this category is that heroes had heroes. This typology described wanting to lead by example and therefore be acknowledged for making a difference. It is about leaving a legacy; just like others or family did by being heroes.

Had a hero dimensions

- ➔ Family
- ➔ Others

Figure 63: Hero category functional pillar dimensions B

Family shaped *Heroes.* Some had family heroes like an ambassadorial father, old wise people, or a father who owned a diamond mine. CL4P2 described how being surrounded by grandparents inspired him to be heroic, *"I like to be around old people. So, grandparents, I always associate with them. So, even now when I go home, people that surround me are all old people, so they tend to talk about old things which according to me are better than the society now. The understanding back then is far better than the understanding now. So, the knowledge back then, eventhough we have gurus, we have all these planetariums and stuff, the knowledge that they had back then is far, far, far better than the knowledge that we do have now".* CL4P4 described following his hero father around, *"Look, he used to take me to where he used to go every time, you know. So, now I think I'm one of those people, if you look at South African society, you've got lots of children who grew up without fathers. Most of them you find out that they're away, but because my father has always been practicing religion, so he knew he was grounded. So, he wanted to impact and impart that kind of knowledge, to me. So, I used to follow him".*

Others also shaped *Heroes*. CL4P4 said, *"…you know I was mentored later in life. Now, he asked me, this guy, 'what do you do?', I told him. So, he put much focus on me. He's a person who, actually, made me to be double what I am now, because I also deal with investments in terms of Africa you understand. So, he showed me how to do DIP funding, how to raise a level of funding required for any other things, you see, whatever I can be able to do".* CL4P8 was inspired by her environmental conscious mother-in-law, *"In our home I should thank my mother-in-law you know, they make a point to* (live environmentally friendly), *they go into Africa; they have seen more of what goes on in our own country than most people. It is not just about 'consciousness'; she understands why she does something* [translated from Afrikaans]*"*. CL4P3 described being his own hero while he was growing up. "…*when I was in Form 3, I started paying for myself. Then, I would go to sell the fruit and vegies at the train station, not veggies, just fruit, at the train station, I could help mommy because of the other siblings that were still at school, so she didn't have to worry about me"* (CL4P3).

5.5.2.3 Micro condition: Achievement and legacy important

The *Hero* typology aims to leave a legacy behind within the context of their lives and therefore it is a micro condition. Leaving a legacy is altruistic for some but for others it is about a sense of achievement. Leaving a legacy is about being both ambitious and exploratory.

Achievement and legacy important dimensions

- ➔ Ambitious
- ➔ Exploratory

Figure 64: Hero category micro condition dimensions

In order to be a *Hero*, they needed to be ambitious because it requires commitment and focus. CL4P1 said, *"My purpose is to live, and to be healthy, and to achieve certain goals".* CL4P3 concured that vision is required to be successful, *"I also value my career, my studies because I might have an ambition that I want to see myself in that level because where I am is not where I need to be".* Ambition might also require some sacrifices, *"I'm not married at the moment because I'm pursuing my MBA"* (CL4P4). CL4P5 had to leave her job to look after her husband but was ambitious to return, *"So, I accepted a senior secretarial position which is much lower than the one I had. I'm now acting in an administrative position for the Maternal and Child Health Unit".* CL4P6 said that ambition is triggered from an early age, *"So, come Grade 8, I told her* (mother) *'Can I please go to boarding school because I really am looking forward to succeed in life?'".* CL4P8 said, *"I have lots of ambition and things I want to achieve in the short-term* [translated from Afrikaans]*".*

Heroes were somewhat exploratory in that they seek new and exciting opportunities to be successful and to reinforce their heroic activities. A *Hero* was seen as somebody who needs to be able to handle anything that comes their way, so they move around easily and feel comfortable with evolution. CL4P1 talked about, *"…being adventurous"* and CL4P2 described himself as *"…a bit of everything...".* CL4P4 described a sense of restlessness when he said, *"You know, I don't do something for too long",* and *"So I've always been, I always like to move and see places".* CL4P8 continued, *"Wow, things are going to evolve and there will be so much opportunity available*… [translated from Afrikaans]*".*

5.5.2.4 Macro condition: Religion guides interpretation and living of life

Religion emerges as important to this typology, but it is also something that has social relevance and is therefore a macro condition. They spontaneously refer to their religion as something that guides their general beliefs, specific beliefs and shapes their relationship with nature.

Strong beliefs dimensions

- ➔ Religion shapes beliefs
- ➔ Beliefs about gender roles
- ➔ Beliefs about nature

Figure 65: Hero category macro condition dimensions

Religion shaped their beliefs. CL4P2 said, *"…before church, I used to party and drink. So now, I've just found a better side of life".* CL4P3 noted, *"My purpose in life, besides studying and everything, is just to work for the kingdom of God"* vocationally, "*I want to study theology to get more insight".* CL4P4 whose father is a pastor said, *"Yes, I am a Christian, but I accept people. It does not matter where they come*

from". CL4P5 noted, *"I think my prayers. I pray. We have the five daily prayers, and we have one sort of like in the middle of the night, like the four o'clock prayer. So, many a times I wake up for that, and I go and pray and, then at 4:30 when we're finished, I start my day".* CL4P5 continued, "*Sometimes people say, 'Just remember God doesn't sleep if you do something bad, it comes back to you tenfold'. I'm always conscious of that, always, and I try not to do anything bad knowingly, and unknowingly".* CL4P6 said that she goes to church all time and is also involved in church activities, *"I do a lot of things in church beyond my capacity, but I still do it".*

Religion affected beliefs about gender roles. Since this typology has a skew towards males, it suggests some patriarchal worldviews. CL4P2 said that men are superior to women, *"Let's be neutral. In Africa, a woman is the neck, and the man is the head. So, the man is always superior to the woman, not that he's going to abuse her or stuff, it's just that the man is the main household in that home".* CL4P5 described entrenched gender, *"Well, I was taught that men are there to provide for women"* therefore, *"I think girls tend to draw more to their fathers than the boys to their mothers".* CL4P5 described feeling judged for being a working mother, *"A maid, a domestic is raising your kids".* CL4P7 said her husband is emotionally unailable because he is the primary breadwinner, *"His job is his life. He works for the company like he owns it. He's very dedicated which, sometimes, is good, but sometimes it's not so good".* CL4P8 said, *"You know, men are logical thinkers and deicion-makers. I think they are the ones that should make plans that will make society progress. Funny enough, I think women are there to action these plans* [translated from Afrikaans]*".*

Religion shaped their beliefs about nature and was supported by Biblical references. CL4P3 described nature as a representation of something God created, *"God created them and then you've got your ocean, you've got your river, you've got your streams there, you've got your animals there, you've got your grasses out there, you've got your trees and, then those fruit trees that are not being planted by anyone".* CL4P4 refered to nature as a representation of God, *"You see, we found nature the way it is. It is something that is quite inexplicable. It's something that is magic, it's something that is amazing. How do I phrase it? It resembles God".* Similarly, CL4P5 said, *"I also draw my strength from little things in life. Flowers, beautiful flowers are a gift from God, a cat walking outside is a gift from God, animals, the sun that is shining".* CL4P6 described hierarchy in nature, *"I think, for me, nature is like a big structure where we also fall under, you know kind of thing"* (CL4P6). CL4P2 described a mechanistic view of nature, *"So, the purpose of every living thing is to live, to keep that natural order, to be nature".*

5.5.2.5 Process: Helping

The process of becoming a hero includes helping others and their families. Helping gives them acknowledgement of their status as a hero in society.

Helping dimensions

- ➔ Helping others
- ➔ Helping family

Figure 66: Hero category process dimensions A

The *Hero* emerged as somebody who wants to help others. Participants in this typology described volunteering for lifeline, working with HIV communities, and building housing for the poor. CL4P1 said, *"I need to help out".* CL4P5 noted, *"I see myself as wanting to be that person, … that people can look up to and say 'I know she will help me', If I can do something for somebody else's child too, that would improve their lives, or that would make them stand out. I would love for everybody to just have enough to eat everything all day, and not go home or go to bed hungry because I see it every day".* CL4P2 stated, *"You're not doing it for the money of it".* CL4P3 worked for lifeline: *"I'm working for Life Line as a counsellor on the AIDS helpline".* CL4P4 builds housing for the poor, *"We're building faster using that technology...".* CL4P6 was trying to find a cure for HIV, *"Like, in most of my community, people have HIV, and most of them are not actually taking the treatment, just because they're afraid that some other people actually know about their status, … that just motivated me to know more about HIV, why it's so difficult to find a vaccine, and why is it so complicated, why haven't they found a vaccine, till today. So, that's what actually motivated me, so that's why I'm doing research on HIV".*

They saw themselves as being a *Hero* to their family. CL4P6 said, *"For me, I just want to make a difference in my family".* CL4P1 noted, *"I suppose be secure financially, and make sure my kids are self-sustainable financially, or make sure that they finish at school, so they're self-reliant...".* CL4P2 said, *"The more important factor in our society is putting food on the table, building a house for your family, and all that stuff".* CL4P3 said, *"I'm just like their* (family) *Superman".* CL4P5 continued, *"My daughter was abused by somebody in our area when she was about 14 years old, she just turned 14. So, I decided to raise the child* (as my own)*".* CL4P6 noted, *"I'm kind of the breadwinner of my family. So, with my Masters, they give us like a stipend, so that stipend is kind of helping out* (her family)*".* CL4P7 described being a hero to her deaf son, *"Eventually, I just spoke up and I said 'I'm sorry you're* (her brother) *not going to speak to him like that', and they started calling him a moffie, telling him that he's a moffie. I just said 'No, you don't do that'".* CL4P8 described wanting to be a hero to her children, *"What I am most afraid of is to have children and then to have to tell them I do not have the money to make their dreams come true* [translated from Afrikaans]*".*

5.5.2.6 Process: Building a legacy

Heroes have a legacy that remains after they are gone. Building a legacy is a process of facing personal challenges and being your own hero after which you help others.

Process of building a legacy dimensions

- ➔ Facing challenges
- ➔ Building a legacy

Figure 67: Hero category process dimensions B

The process of building a legacy started with facing challenges such as emotional abandonment, feeling isolated from their community, experiencing financial challenges, apartheid, being physically abused, and losing a parent at a young age. CL4P2 said, *"When I was young, to be honest, the neighbourhood that I grew up in, and the society that I grew up in does not encourage us to take notice of what is important to you..."*. CL4P3 described financial challenges, *"…you are a single parent, a single mom who's not having a proper job that can bring enough money to raise the kids"*. CL3P4 noted, *"My mother was there most of the time at work. She was doing domestic work. You know how it is, you clean, you do this, you do that for your employers"*. CL3P5 said, *"Then the Group Areas* (Act) *put us out in the very ripe Apartheid year"*. CL4P6 was abused, *"Because every time we were wrong, my mom beat us, beat us, beat us. We hated our mom"*. CL4P7 described having a close relationship with her father and then losing him when she was younger, *"So, he did eventually die because his whole system started breaking down, really speaking. He was only 57 when he died"*.

Building a legacy also meant understanding the self through introspection. CL4P4 said, *"I want to build a legacy, you understand. It's about another generation is giving life to another"*. CL4P5 noted, *"You need to be firm in your belief and, just have both feet firm on the ground, and know what you want to do, and where you'd like to go"*. CL4P1 described non-materialism, *"Because, I don't see the point whereby most people have got so abandoned versus those who are financially independent whereas others hardly have anything. So, maybe if wealth can be shared, so at least everyone gets a meal, that would be my wish"*. CL4P2 said, "… *I always tried to make decisions myself"* as independence of thought is valuable to this typology, *"*(I am most scared of) Losing myself. Losing my thoughts".

5.5.3 Nurturer / Peace keeper category

Being nurturing and wanting to keep the peace is part of being a hero. This typology thrives on peaceful interactions with the outside world but also wants to have inner peace. They are people-centric which means that environmental issues and concerns are interpreted through a humanistic lens (i.e. what does it mean for people and retaining peace amongst people). As such, they see nurturing with food as a way in which to mitigate climate change and key to retaining peace.

5.5.3.1 Functional pillar: Identifies as a nurturer

A functional pillar of this category is that this typology identifies as a nurturer. The *Hero* typology believes in the concept of nurturing humans for a better a world. They describe two ways in which nurturing takes place for them. The first is active nurturing which is the physical act of taking care of others. They also describe a form of inspirational nurturing which relates to empathy, sympathy, and compassion.

Identifies as a nurturer dimensions

- ➔ Active nurturing
- ➔ Inspirational nurturing

Figure 68: Nurturer/Peace keeper category functional pillar dimensions

Active nurturing was described as taking leadership. CL4P5 said, *"My husband was away for two weeks, and I so much wanted to protect her that I didn't really do anything about going to the cops, or having it reported, or getting her counseling, or anything".* CL4P3 noted, *"I'm able to get together and then take my niece, nephews to school, even before their father passed on. So, now I'm the dad that they're looking at because their father has passed on".* CL4P5 took care of her ill husband, *"I worked for nine years and then my husband had a stroke/subarachnoid hemorrhage with a left frontal craniotomy. So, I resigned, and I was at home for six months to take care of him".* CL4P6 continued, *"We were mostly close to my dad because my mom was always working, and every time she came back home, she just slept, and we did all the work in the house, just to help out".* CL4P7 said, *"My dad was very sickly when we were growing up. It was like having another child in the home because she had to try and reason with him and sometimes, he was okay, and other times he wasn't".* CL4P8's mother had cancer, *"I love my mother and it was sort of instinctual to be there for her* [translated from Afrikaans]*".*

Inspirational nurturing was explained as the emotional contribution of being a nurturer. *"People have often said to me, like I'm the motherly figure, but I don't know why"* (CL4P7). CL4P2 said, *"If people can understand that in life material stuff doesn't really matter, the most core thing in life is love"* and this will solve planetary issues, *"What will save the planet? Is that everyone should care for the planet".* CL4P4 said, *"I'm very sympathetic to the cause of other people. I have a feeling towards, I feel for other people".* CL4P5 noted, *"I just like to be there for my family and provide, for them as adequately as I can and not just financially, but also be a support system for them, be the mother for them, and then just to serve my God, and be the best that I can be, not just for my family, but for my community and everybody else as well".* For CL4P7, *"I think I'm the peace-giver, or try to be anyway" and "I think it's* (purpose) *to help people and to make everyone's life better".* CL4P8 said that part of this internal drive to be a nurturer is about feeling responsible for others: *"I feel very responsible for my* (works in human resources) *people* [translated from Afrikaans]*".*

5.5.3.2 Process: Seeking peace

A natural process of nurturing is seeking peace. They tend to be accepting of others while still having strong beliefs of their own. They work hard to find peace in the outside world and regardless of the challenges they face, they focus on positive elements and peace in their lives in order to enable themselves to be a hero, nurturer, and peacekeeper.

Seeking peace dimensions

- ➔ Seeking peace with the outside world
- ➔ Having peace in the inside world

Figure 69: Nurturer/Peace keeper category process dimensions

This typology seeks peace with the outside world and described being open to others through the process of understanding and acceptance. CL4P1 said, *"There won't be fighting, there won't be war. I will just understand peoples' views and beliefs. I won't judge any person because of A, B, C, D".* CL4P2 noted, *"I said 'No, man, it's not working out'* (his unethical job), *because the overall issue wasn't about*

selling, but the issue there was about the guilt, because you have to lie there. Putting people in debt for something is not worth it" also, *"There is no understanding that everything you do, you have to do with happiness".* CL4P3 said, *"I get used to people easily, and I can make friends easily"* and *"I just like happiness and laughter wherever I am".* CL4P5 continued, *"Everybody sees me as very happy-go-lucky; always pleasant; a very generous type of person. You see, first of all, we need to understand and accept that we will always experience things differently",* and *"We must understand that I cannot be you, you can't be me".* CL4P5 said, *"You have one life, and you must live it to the fullest as though there is no tomorrow, and you must appreciate the little things around you".*

They self-inspired peace through artistic expression, rich culture, close families, being surrounded by children, and being part of girl-guides. CL4P3 spoke of finding peace through art, *"We did that kind of music, and having dances, and playing drama, all kinds of dramas. Then, I had to do stand-up comedy when we did our shows, and play drama and participate in singing, and gumboot dancing".* CL4P5 spoke of growing up in a family rich in culture, *"I come from a very rich Muslim community. When I say 'rich', I mean rich in culture and people that care about people and life around them",* and experiencing connectedness, *"My mom would cook these huge lunches and suppers and we would all just enjoy being together, eating together, playing together".* CL4P4 grew up similarly, *"I grew up in a stable family".* CL4P6 described connecting with children, *"So, in my free time I would just play with the kids around the area, play the normal games we played".* CL4P4 also had a strong sense of community service, *"I was also involved with the girl-guides. You know the scout group. We used to go away on camps, do a lot of community service, that type of thing".*

5.5.3.3 Action-interaction: Climate change might impact peace

The dangers of climate change are an action interaction as they pertain to the discussions this typology has with themselves. They spontaneously mention the importance of food security and human health in the context of climate change threats.

Climate change might impact peace dimensions

- ➔ Importance of food
- ➔ Importance of health

Figure 70: Nurturer/Peace keeper category consequence dimensions

The *Hero* typology described food as playing a key role in climate change adaptation and nurturing. CL4P2 said, *"Food is scarce, it's getting expensive".* CL4P4 continued, *"Here, it does not matter according to me as to what is growing here, but we need to address the issues of food security"*. CL4P8 noted, *"It affects the food chain right from the bottom up. If you are unable to grow plants and if there are no insects to pollinate, in turn there will be no food* [translated from Afrikaans]*"*. CL4P6 described food as key to life and sustainability, *"Yes, food does give life. I think sustainability. As I said, you get growth from the soil. You get fed from the animals. You get your eggs from the chicken. So, you get life … I would like to have big sustainability gardens for everybody, and I think that contributes to climate*

change (adaptation)*"*. CL4P7 suggested ideas for sustainability, *"Some people say 'you must use organic food, and free range animals, and all that'".*

The *Hero* viewed health as very important. *"I think health* (is what I value most)*. Because, if you are healthy, you are able to do a lot of things"* (CL4P1). CL4P2 linked climate change to health issues, *"There is an effect on our health* (climate change)*. So, we are not living the natural order that we are supposed to live in".* CL4P3 said, *"Eating less meat will also be for healthy reasons".* CL4P4 said, *"I will tell you why I also support that* (eating less meat)*, personally. Red meat on its own or meat has an impact on the body of a person. Remember, what you eat is what you are…".* CL4P6 felt impacted by climate change, *"I mean, today it can be hot and then become cold, and then once it's cold, I get really affected. Then I get sick, just because of climate change. I mean I get flu; I get a blockage of my sinuses".* CL4P7 cotninued, *"Also, the sunburn, I'm just thinking about sunburn, how they've got to always put block-out on, and protect themselves, and that type of thing. If there is no protective layer, then they're going to get burnt".* CL4P8 noted, *"I have seen firsthand how it impacts me negatively when I eat too much unnatural products* [translated from Afrikaans]*"*.

5.5.4 People-centric category

The *Hero* typology is human-centric and therefore they connect to nature through humans. They are concerned about the impact climate change will have on humanity (i.e. food insecurity, skin cancer), rather than species extinction impacts. This lens explained the incongruence between their affective relationship with the biosphere and their environmental worldviews. They are emotionally connected to nature in as much as it benefits humans, but their worldview is not biospheric, it is aligned with their traditionalist and religious values. They express high expectations from nature.

5.5.4.1 Functional pillar: Nature benefits humans

Their relationship with nature is valued only to the extent that it supports humans and therefore forms a functional pillar. They evaluate the benefits of nature to humans for the self as well as for others.

Nature benefits humans dimensions

- ➔ Benefits of nature to self
- ➔ Benefits of nature to others

Figure 71: People-centric category functional pillar dimensions A

Nature was seen to provide individual benefits. CL4P4 described nature as providing both entertainment and sustenance, *"Like, if you go to the Kruger National Park, it's about entertainment, it's about looking into their survival day-to-day, except maybe turning them into some kind of a, what do you call it, food".* CL4P2 said, *"Nature is tranquility".* CL4P5 continued, *"They wait for people from outside to come, people to come from Johannesburg to go to the beach, or to go to Table Mountain, and they would go with".* CL4P6 said that time is a restraint, *"I love the beach, but I just don't have time to go to the beach".* CL4P7 described having a family that participates in fishing as a sport, *"We're members of what we call*

'The [X] Club'. It's really family-oriented, a lot of farmers, even though we're not in the farming community". She also described traveling to find the peace provided by the Transkei, *"…the scenery and all that reminds me of when we are at peace down there".* CL4P8 described nature as her escape. *"Nature, until this day is an escape* [translated from Afrikaans]*"*.

Nature provided generalised benefits. *"…like the water that we drink; vegetation. Basically, that's it…"* and *"Why I said 'to an extent' is because people, for example, are cutting trees for firewood, or timber to make other end products from trees"* (CL4P1). *"Maybe, also, if it has fruits, it gives them fruits"* (CL4P3). *"The trees give food…we're using herbs to produce, or rather to manufacture, you have spices, you have parsley as a plant, you understand"* (CL4P4). CL4P7 said, *"It* (nature) *gives us water to drink and food to eat"*. CL4P2 described animals used for entertaining people, *"Animals are put in cages to behave, just to please people".* CL4P5 noted, *"Nature is there to sustain us, not just in providing".* The benefits that nature provides humans are provided by God, *"That's where they need to appreciate and thank God for it"* (CL4P3).

5.5.4.2 Functional pillar: Connects with nature through humans

Linked to the people-centricity of the *Hero* typology is the fact that they connect to nature through humans as another functional pillar. They also connect to the concerns about nature through their concerns about the impact it will have on humanity. They describe instances where they connect to nature through children.

Connects with nature through humans dimensions

- ➔ Connects to nature through children
- ➔ Concerns about humanity

Figure 72: People-centric category functional pillar dimensions B

The *Hero* typology saw nature in children. CL4P2 described the enjoyment he receives being around children, *"I do enjoy being around children"* and *"…you play with kids"*. CL4P3 said, *"Then, there is childbirth, and people, and everything is nature".* This extends to participating in youth programs *"I used to be a youth leader"* and leaving a legacy by having kids *"For humans, it's just to live and to be able to multiply and to serve the Creator"* (CL4P3). CL4P4 added, *"The child must live in an environment with a clean type of, what do you call this thing, oxygen, they need to breathe".* CL4P5 focused on children in her life since works in a children's hospital but also does local community outreach with children, *"I'd like to have places where children can run and play and fly a kite and enjoy themselves and not worry about a car that's going to knock them down on the road".* CL4P7 noted, *"But, then my daughter goes to guides* (girl-guides)*".* CL4P8 worked in children's education and spent a lot of time in poorer communities with children, *"We do children's education and we have just expanded into TV education* [translated from Afrikaans]*"*.

The *Hero* described being primarily concerned about human-centered environmental issues. They explored human suffering, future challenges that will be faced by humanity, poverty, economic decline, limits to growth, and the impact this will have on future generations. *"So, if the trees are not there, then we will be in trouble"* (CL4P3). CL4P2 talked about being captured by poverty, *"Then, let's just say this guy here, Family A, the next generation is struggling, so he just moves there".* CL4P5 talked about seeing the suffering in others, *"If I look at how other people live, if I look at the challenges other people face, mine is a drop in the ocean"* and specifically about poverty when she said, *"… I would also change poverty".* CL4P6 focused on HIV, *"Umm, I think once there's a HIV vaccine, people are not going to be scared anymore of just having unprotected sex because there is a vaccine, there is a cure. People are not going to be more careful"*. CL4P7 focused on malaria, *"I will kill the mosquito and that type of thing, but, yes, preserving for our children and our grandchildren and life beyond...".* For CL4P8 she mentioned the world running out of metal as a concern for humanity: *"There will no longer be metal because it takes years to form* [translated from Afrikaans]*"*.

5.5.4.3 Consequence: High expectations from nature

As a consequence of their people-centric nature, they have high expectations from nature. Nature is disappointing compared to the joy humans give them. This attitude is in part because of recognition that humans can provide joy and acknowledgement, and nature cannot. Furthermore, the decrease in available nature due to urbanization and subsequent technological development (i.e. the way nature looks in documentaries compared to reality) leaves this typology feeling disappointed in nature. Nature has limitations, they have sympathy for nature, but they feel that destruction is part of human evolution.

High expectations from nature dimensions

- ➔ Nature has limitations
- ➔ Sympathy for nature
- ➔ Destruction part of evolution

Figure 73: People-centric category consequence dimensions

The *Hero* viewed nature as having limitations. *"So, the most common thing is limitations, basically"* (CL4P2). CL4P5 said, *"Nature has its off days when there's thunder and lightning*". Nature was described as destructive, *"…but, climate change, to me, means that we need to take care of nature more because, like all the tsunami's that we get, they take life. It's destructive"* (CL4P5). Nature was also described as fragile, *"I felt so sad that I realised that taking care of nature* (because it) *is very fragile"* (CL4P6). CL4P5 noted, *"I see the shark as trying to take life away".* Natural processes were experienced as upsetting, *"I know it's sometimes nature that they do come on to the land* (whales) *which is distressing…"* (CL4P7). CL4P8 said, *"I had a miscarriage last year, so it complicates your ideas* (about nature) [translated from Afrikaans]*"*. CL4P2 noted, *"I'm scared of dying in water, of drowning. I can't swim … the other thing is a baboon. A baboon is associated with witches. They ride on baboons at night when you're sleeping".* CL4P3 said, *"If I had to remove something, I think I would remove all the dangerous animals. Like, snakes and lions … I mean all those dangerous animals that are poisonous,*

like spiders, I don't like them. They're not friendly". CL4P7 continued, "*Look, I know snakes are still part of nature, but I've got a terrible fear of snakes".*

This typology expressed a degree of sympathy towards nature. CL4P2 said, *"People are harming the forests for personal wealth".* CL4P3 continued, *"Littering contributes negatively on nature".* CL4P4 said, *"Look, with me, I would say people must stop taking from nature, they must also give. They must replenish".* CL4P5 acknowledged destruction, *"I feel very sorry about nature and 'hate' is a very strong word, it's a very bad word, but I hate people destroying nature for instance…people throwing cigarette butts out of the windows…and the animals that they kill, the rhino horns that they poach".* CL4P2 talked about behavioural sympathy, *"…what I do is I try to swerve them back to their places without harming them, a snake or whatever animal it is, and also if I find an animal which I think is close to extinction or maybe it's endangered, I try hard to protect it, just to put it deeper into the wildlife where people can't find it just that it has its natural environment to live in".* CL4P6 said, *"I think …they are also living* (with) *their feelings".*

The *Hero* described destruction as part of evolution, especially when humans are prioritised over nature. They had an expectation that nature needs to help with human evolution because they are people-centric. CL4P2 said, *"What causes the gap in the world is people want to move forward. People don't care how they go forward, they don't care what they lose, they just want to move forward".* CL4P4 continued, *"…the situation has changed from the City of Gold to the City of Opportunities. These are the trees and then this is the land where there's a development taking place".* According to CL4P6 sustainability impacts on comfort, *"So, those kinds of implementations can be done, but even though people are still not comfortable with a bicycle, they want cars".* This need for evolution reduces nature appreciation according to CL4P7, *"I'd say this one, maybe because it looks like he's very depressed or not appreciating what's outside".* The need for progress was especially important for people who moved to the cities from smaller towns, as was the case for CL4P8, *"I come from a very small town that forms my background* [translated from Afrikaans]*".*

5.5.5 Impacted by climate change category

They are somewhat concerned about climate change and perceive the impacts to be noticeable, yet not understandable. As described earlier, they spontaneously mention climate change impacts that will influence the wellbeing of humanity.

5.5.5.1Consequence: Climate change is veiled

A consequence of their human-centric worldview is that they feel climate change is veiled. It is veiled in that they show concern but feel that the causes are somewhat unclear or uncertain, although the impacts of climate change can be felt.

Climate change is veiled dimensions

- ➔ Lack of understanding
- ➔ Concerned

Figure 74: Impacted by climate change category consequence dimensions

CL4P4 felt that climate change is incomprehensible, *"It's something that is beyond our mind, you see, but we've got to persevere at the end of the day".* CL4P2 described uncertainty as contributing to climate change, *"I don't think they're* (his community) *aware of climate change… people don't understand".* CL4P3 said, *"Sometimes you look and then wonder 'how did this happen?'"* CL4P4 perceived climate change as veiled, *"I say it is something that you cannot explain as to what makes what you see…".* CL4P5 stated, *"I don't really know* (what causes climate change) *I haven't really given much thought to that. I don't think so* (does he personally contribute to climate change)*".* CL4P5 reflected on the causes of climate change, "*I suppose, the aerosol cans. I do try not to use them now but, I do on occasion".* CL4P8 said, *"I fear that people in households lack the knowledge to have a positive impact* [translated from Afrikaans]*".* CL4P4 noted, *"I need to address the governance from the ecological point of view".* CL4P5 said, *"I don't know if there's anything that I could do, or anything that I can do to save this world on my own".* CL4P7 said, *"I've always got a brown paper bag at home that we put all our scrap bits in, and whatever".* CL4P8 felt that relinquishment is a solution, *"Good heavens! You should start with not using your car as a first step*… [translated from Afrikaans]*".*

Although the causes of climate change were described as somewhat veiled, they felt impacted by climate change. CL4P7 described the impact as, *"So, I think definitely it is affecting us whether we like it or not. Whether it is from the ozone layer, or from deodorant cans, or whatever the story is, it's definitely changing and affecting us".* CL4P1 said, *"I will give you examples. Global Warming – I think there's more cons and problems* with the drought as an indicator, *"… with global warming right now we, didn't have enough rain last year".* CL4P2 continued, *"I think it has already made an impact, apart from the world being hotter and also some parts are not receiving rain as they should be".* CL4P3 noted, *"So, it's bad because it means that if something went wrong somewhere, it cannot just change out of nowhere".* CL4P5 said, *"Climate change to me strangely enough, I thought about it yesterday. I thought 'my word, we had summer and now it's spring and winter is back again'".* CL4P6 also described seasonal concerns, *"From what I've learnt, I feel like global warming does have an effect, in a way. Like, some seasons take longer than other seasons where it's supposed to be cold and it's still hot".*

5.6 Typology 5: The Explorer

"I think it's fun, but I derive that fun from exploration, from finding out things, from seeing things, from exploring, from meeting people" (CL5P1)

"I like watching people. I like noticing things. There are so many things happening in life around us and, sometimes we miss them" (CL5P6)

"Going out and seeing other places and seeing how people interact with each other, it actually grows you as a person" (CL5P4)

5.6.1 The Explorer: Categories, Properties and Dimensions

The identity-inspired label that described this typology is *The Explorer*. Four categories emerged, namely explorer of the world, universalism, interconnectedness with nature, and climate change as changing relationship with nature. The *Explorer* is open to the world, others and nature. Their openness and connectedness with nature leads them to experience unity with the biosphere. This unified relationship means that they feel climate change is having an impact on this relationship that they have. Within the four categories there emerged 13 properties with associated dimensions. Figure 30 shows how each property plays a role in the typological system as a functional pillar, micro condition, macro condition, consequence, or process.

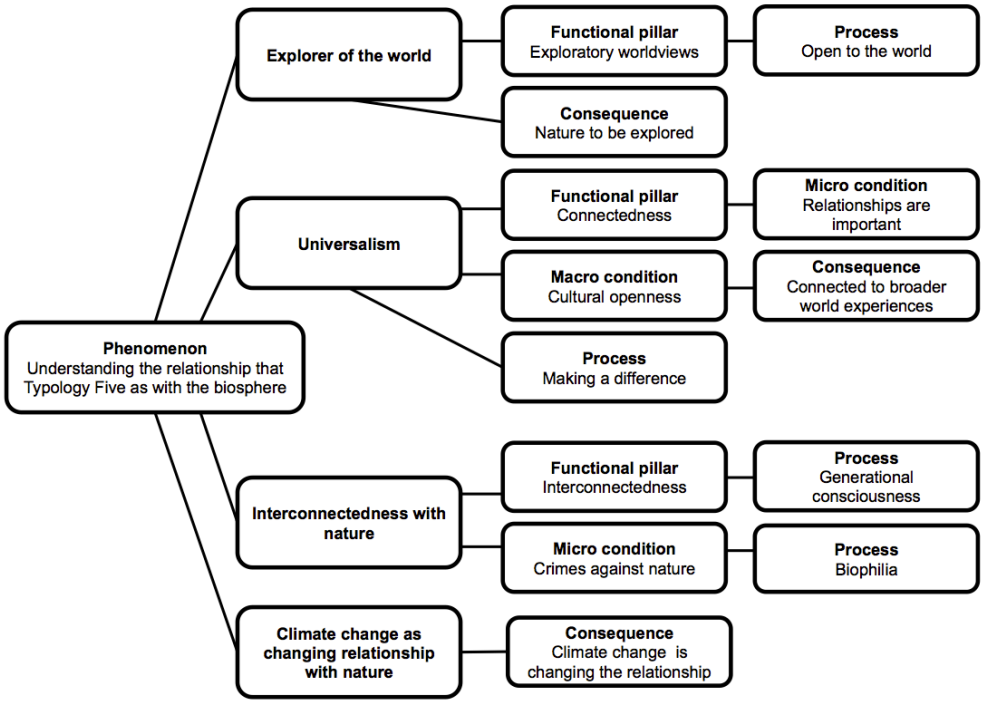


Figure 75: The theoretical structure for the Explorer typology showing categories and properties

5.6.2 Explorer of the world category

The *Explorer* typology has a non-restrictive worldview. They perceive the world and nature as something to be explored. They show an oppeness to the world, compassion and an ability to take perspectives.

5.6.2.1 Functional pillar: Exploratory worldview

The functional pillar of this category is an exploratory worldview. Being an explorer means seeing the world as an adventure. They are curious, fearless, comfortable, and yet resilient.

Exploratory worldview dimensions

- ➔ Curious about the world
- ➔ Comfortable with self in the world

Figure 76: Explorer of the world category functional pillar dimensions

To the *Explorer*, curiosity brings joy, *"I think it's fun, but I derive that fun from exploration, from finding out things, from seeing things, from exploring, from meeting people"* (CL5P1). Exploring was described as seeing places, *"My husband that is financially retired and I spend quality time together. We visit places…* [translated from Afrikaans]*"* (CL5P3). CL5P5 described being open to different religions, *"I was very lucky in that I went to different churches with different friends* [translated from Afrikaans]*"*. CL5P6 said, *"I like watching people. I like noticing things"* and, *"I like challenges, so I tend to always look at something for the next thing to do"* (CL5P7). CL5P1 described spending time with homeless people, *"So, fun is just going out, meeting people, exploring. I spend a lot of time on the streets"*. CL5P5 attributed part of his exploratory worldview to growing up in a diverse neighbourhood, *"Because I grew up in Jeppestown there was a diverse range of cultures. Italians on the one side, Portugese on the other side, and Germans across the road* [translated from Afrikaans]*"*. Observing was key, *"There are so many things happening in life around us and, sometimes we miss them"* (CL5P6).

For them, to be an *Explorer*, you needed to be comfortable with yourself in the world. They were comfortable to be alone or with others, they seemed resilient, and they never saw themselves as a victim. A key attribute of the explorer type is their internal vibrancy towards life, *"I think life in itself is fun. I think that's what keeps me alive"* (CL5P1). CL5P2 said, *"To me it means that I don't need people around me all the time. I do not need group interactions to get attention or be the centre of attention. I am happy just to stay at home and keep busy with my own matters* [translated from Afrikaans]*"*. They described a sense of fearlessness, *"There is nothing I am really scared of…"* (CL5P3). They had an anti-victim attitude, *"So, if you think you are a victim, then you feel like there's nothing you can do about it to change it because 'it's everybody's fault, it's not my fault that everything is this way'"* (CL5P4). CL5P5 described being comfortable being by himself in public, *"If it isn't nice, I go sit in a pub, I like to just people watch"*.

5.6.2.2 Process: Open to the world

The process of being an *Explorer* in the world is being open to the world and what it offers. They describe easily forming connections with people, exploring places, and having experiences that are meaningful. They do not just passively move through life, but they interact with life and others.

Open to the world dimensions

- ➔ People
- ➔ Places
- ➔ Experiences

Figure 77: Explorer of the world category process dimensions

They easily connected with people from different backgrounds and with different beliefs. They embraced compassion, and the white participants in this typology often spoke of being aware of white privilege. CL5P1 said, *"You could go meet someone on the street and you weren't scared of what they would do to you. So, it's finding like the right channels of communication for people"*. CL5P3 noted, *"I bring a groundedness to people at work and they come to me. I attract people who are going through difficult times* [translated from Afrikaans]*"*. CL5P4 mentioned, *"Going out and seeing other places and seeing how people interact with each other, it actually grows you as a person"*. CL5P5 adopted a boy, *"I always said that I don't like children and that I never wanted children of my own. I used to keep children at a distance. But this little boy has taken over…* [translated from Afrikaans]*"*. CL5P6 said, *"Eventhough I am a man, I can still have compassion and still care about people because, sometimes, if you spend too much time with a male figure, you might be too hardened or have no empathy towards people or not be very kind"*. CL5P7 continued, *"… a big point of being South African is actually becoming aware of being white which is something in Italy I was not aware of …".*

They spoke about the enjoyment of travelling since they move around easily to and through new places. *"That's the big thing for me, is if I can put myself into places and experiences that's what I want to do. I'm not particularly concerned about my own well-being. I'd rather put it on the line and explore"* (CL5P1). CL5P2 said, *"We often think of moving to the Cape since my husband does a lot of work there* [translated from Afrikaans]*"* (CL5P2). CL5P3 described enjoying new places, *"We love driving around and surfing"*. CL5P4 desired exploring new places, *"Because growing up I can't say I really travelled or visited other people and saw places and stuff"*. CL5P6 said, *"I did travel quite a bit"* and *"before we stayed there, we actually stayed around quite a lot"* (CL5P6). CL5P7 continued, *"I value going out and traveling, going into nature, or seeing new places"*. CL5P5 described moving around easily, *"So I left for Bloemfontein, I stayed there for three years and now for two years in the Cape".*

They described themselves as living in the world as permanent tourists. CL5P1 said, *"So, that was another really interesting part of the world. Because it was a small town, there was limited crime"* which extends to his adulthood, *"There are no boxes. What happens happens. I'm one with that"*. CL5P2 became nostalgic about the places experienced, *"That was in the good old days when it was still safe for children to go out with their bicyles to go and play at the stream or go to the beach* [translated from Afrikaans]*"*. CL5P4 noted, *"I would say I'm the type of person who doesn't believe that your background should like stop you from achieving your dreams and stuff. So, if you change the thinking, then, most things will change"*. CL5P5 described being gay in the army, *"I was lucky to get out of there whole…partially. After I got out* (of the army) *I was lost for a while and struggled to find my feet. I wasn't sure where I fit in because of the stigma attached (*to being gay) [translated from Afrikaans]*"*. CL5P6 said, *"I love learning new stuff..."*. CL5P7 worked as a guide, *"In Cape Town, there's lots of tourism, and I worked as a tourist guide for a few years".*

5.6.2.3 Consequence: Nature to be explored

A consequence of their exploratory worldview is that they view nature as something to be explored. They describe emotional experiences, physical experiences, and the power in just exploring nature through observation. Exploration occurs at different sensorial levels. This means that they connect with the biosphere deeply, rather than superficially.

Nature to be explored dimensions

- ➔ Affectively
- ➔ Physically
- ➔ Observations

Figure 78: Explorer of the world category consequence dimensions

Spending time with nature was described an affective experience. CL5P1 described nostalgic childhood experiences, *"My father had the foresight to buy and build, and he did it in a location where there was a large sort of storm water servitude at the bottom of the garden which was incredible. It allowed us to sort of engage with nature on a daily basis".* CL5P3 described urban nature as her happy place, *"On a day-to-day basis I have a happy place I can go to. My happy place is at home in my garden with dogs running around, irrigation that is on, very green lawns…that is my happy place* [translated from Afrikaans]*"*. CL5P4 described positive and negative emotion in forests, *"They are part of nature, but you know when you are out there, let's say you are in a forest, the only thing you're afraid of are snakes. You actually feel good about being there but you don't want to see a snake"*. CL5P5 reflected, *"There is an eco-park in Seapoint/Greenpoint. I accidentally landed up there the other day and was impressed by how clean it was and that is how I feel we should co-exist with nature* [translated from Afrikaans]*"*. CL5P6 said, *"I love the beach. I grew up around the ocean, so I like the ocean whenever I get a chance"*.

They described their physical experiences in nature as immersive. CL5P1 said, *"I'm very sort of outdoor-oriented"* and CL5P6 noted, *"I do hike often in Stellenbosch or around Cape Town".* CL6P2 shared memories of walking through the wilderness, *"When I was young there was a path and as a child it felt long and like we were really going into the wilderness. It really felt like we were in the depth of the wildnerness* [translated from Afrikaans]*"*. CL5P4 said, *"Just take long walks there* (beach)*, and I take a lot of pictures"*. CL5P7 mentioned, *"…it could have been April, and I spent two nights in a tree house in a living tree and that was amazing. Mokala National Park ... They had this beautiful secret tree because they don't really advertise it. It's a small house built on this living camelthorn tree and it was just amazing because when you get there it's all still. There are chairs or benches just outside, there's a small deck, and the deck overlooks a water hole. At the water hole, you can see. You don't have to go on a game drive. You can just sit there all day, and you see all the animals passing by".*

They described connecting with nature through observation. CL5P1 said, *"So, we had a huge garden, it was enormous, but it was completely and utterly over-grown with alien invasive plants. So, for the last sort of 35 years or so that my father has been there, or my parents have been there he's gradually re-indigenised it. So, that was fantastic doing that because I got to learn about the outdoors hands-on".*

CL5P2 said, *"We see so many beautiful plants and birds when we walk. It helps that we walk with an avid birder that points out some good sightings like a hawk* [translated from Afrikaans]*"*. CL5P3 continued to highlight the visible beauty, *"But nature, the way I see nature' as I know it in South Africa – beautiful rivers, gardens, flowers".* For CL5P5 this included animals, *"When you look at birds and squirrels, they have no practical value, they are just aesthetic. They are beautiful, their behaviour is interesting and they fascinate me* [translated from Afrikaans]*"*. CL5P7 found beauty in the South African sky, *"Even where it is built, most of the places are just one storey, maximum 2 storeys, so you can always see far actually, while my city* (in Europe) *is really, it's all big buildings, so you don't see far. It's even difficult if you want to see the sky, you have to look out, you can't just look in the distance"*.

5.6.3 Universalism category

Universalism is a powerful determinant in how the system operates. It means that they feel broad-range connectedness. Therefore, they express cultural and experiential openness, relationships are important and because of this they, want to make a difference in the world.

5.6.3.1 Functional pillar: Connectedness

Connectedness is a functional pillar as it described how the typology operationalises universalism. Universalism could also include spirituality (although not part of the Schwartz' value theory: Schwartz, 2012) through describing inner harmony and transcendence over everyday experiences. They describe a sense of connectedness to themselves as well as others.

Connectedness dimensions

- ➔ Inside body (self)
- ➔ Others outside self

Figure 79: Universalism category functional pillar dimensions

The *Explorer* emerged as having a moral compass, is comfortable with who they are, and focuses on personal growth. CL5P1 described going through a personal transitional period, *"I couldn't do it. I tried it (studying politics), but it didn't work out"*. CL5P2 described a sense of purpose linked to not having children, *"We don't have children* [translated from Afrikaans]*"*. CL5P3 described a purpose as coming from within, *"I think everyone has a purpose in this life"* and for her the purpose is to be *"spiritual"* and also that, *"All those experiences add to what you are and what you will become".* CL5P3 described how purpose becomes clearer with age, *"After a while you learn…when you are young you have to navigate how to deal with issues* [translated from Afrikaans]*"*. CL5P4 said, *"I think everything depends on one's thinking"*. CL5P5 described the army an opportunity to connect with himself, *"In those three years you are exposed to hard labour and that can break some people* [translated from Afrikaans]*"*. CL5P6 said, *"I'd say they shaped me in the sense of having more compassion"*. CL5P7 noted, *"When I came from Italy, the first thing I would have said is I definitely have a woman's identity. So, I'm very aware, very conscious of my gender. I read the world through that".*

Connectedness for the *Explorer* included having liberal parents, and valuing others. CL5P1 said, *"I had quite liberal parents. Actually, I'm very fortunate in that respect, very liberal parents"* and CL5P5 concurred, *"I was raised liberally and without a strong religious household* [translated from Afrikaans]*"*. CL5P2 described finding purpose in others, *"Sometimes I think it is with a reason or purpose that they come into your life* [translated from Afrikaans]*"*. CL5P4 described connecting with others through joy, *"I can say that because I've noticed like most people when they talk to me, they say 'Why are you always smiling and always this happy with everyone? Then it makes me realise maybe there's something different about me that they see that I don't see about myself"*. CL5P5 felt negatively impacted by feeling connected, *"At that point I knew I was gay when I went to the army, and then everything became too much* [translated from Afrikaans]*"*. CL5P6 described feeling connected to feminism from a male perspective, *"Wow, there is a lot of power in a woman".* CL5P7 explained connecting through a feminist perspective, *"Of course, the world was made according to a certain meter, and it's a masculine meter. It's a measure, let's say. So, we need to change that".*

5.6.3.2 Micro condition: Relationships are important

For the *Explorer* all relationships are important, including those with people they are close to, those that form part of broader society, and to non-humans. This unique approach to relationships forms a micro condition as it is relevant to the individual context.

Relationships are important dimensions

- ➔ Close human relationships
- ➔ Broader human relationships
- ➔ Non-human relationships

Figure 80: Universalism category micro condition dimensions

Explorers explained the importance of relationships with those to whom they are close, like their parents, uncle, and father. They described growing up in healthy family surroundings. CL5P1 said he is very close to his parents, *"I'm very close to both my parents. They're hugely understanding and supportive"* and also for CL5P2, *"Good. Actually, very good, I always thought that my parents were really good role models for us. No issues or problems and they were happily married. I grew up relaxed and enjoyed school* [translated from Afrikaans]*"* and for CL5P3, *"She* (mother) *is 80. Yes, I see her often and go and visit her* [translated from Afrikaans]*"*.

Broader human relationships were important to them and they described a desire to interact with others from different walks of life. CL5P1 described wanting to broaden his connection with other people, *"So, what's the next best way that I could feasibly interact with people?".* CL3P3 described loving relationships as the most valuable aspect of life, *"Oh, I would fix relationships. Relationships. There is nothing that pains me more than a divorce – especially if it is two people that used to love each other, and they got distant because there is no communication or because there is a problem between parents and children. That should never ever, ever, ever happen. I would bring love back into relationships. I think I value relationships the most in life* [translated from Afrikaans]*"*. CL5P4 described her identity in

the context of wanting to connect with all people, *"I can say, I'm a peoples' person because I always try to get along with everybody. I smile at almost everyone"*. CL5P6 said, *"I like making friends"* and CL5P7 noted, *"Definitely, I would value spending time with the people that I like or that I enjoy being with".*

Non-human relationships like with dogs, nature, trees, flowers, and indirect nature (bacteria) were described as important. CL5P1 said, *"Dogs are natural but they're there because of us. I'd love to own an animal, but I can't, it would be unfair"*. CL5P2 noted, *"Yes, and I enjoy doing training with the dogs and to work with them* [translated from Afrikans]*"*. Giving back to non-humans is important for CL5P4, *"What I give to nature should be … should be my time, love and care. I think it shouldn't be like a choice that you choose not to do it or to do it. It's a must. I'm actually a person who likes planting trees and flowers. I do that when I'm at home. It gives me that sense of achievement, I think. It's an achievement to me, to see that I gave life to this and it's growing because of me and it's beautiful because of me"* (CL5P4). CL5P5 showed concern for overlooked beings, *"It is the invisible things, the bacteria that we can't see. I am very interested in the role they play and what they do for us. Do we need them and if we need them, are we protecting them. Are we not hurting them? Are we not killing them? I am a bit worried about the beings we cannot see* [translated from Afrikaans]*"*. CL5P6 described the experience of interdependence, *"So, nature to me is that – it's the environment around me. I feel sort of interdependence".*

5.6.3.3 Macro condition: Cultural openness

Cultural openness operates on both a personal and societal level and forms a macro condition. They are non-conformists and they do not concern themselves with living by the rules. A black male participant immerses himself into French culture, a white male participant spends time on the streets with homeless people, and a white female participant intentionally moved into a poor mixed area to experience connecting with other cultures.

Cultural opennes dimensions

- ➔ Personal
- ➔ Society

Figure 81: Universalism category macro condition dimensions

They showed personal openness in that they do not follow the status quo. CL5P1 described revolt towards mainstream life choices, *"Like, my contemporaries have all taken a very corporate route, and it's time to get married at age 27 and time to pop out little kids, time to settle down, and time to climb that corporate ladder, and time to see the world in that little cube. It scares the living Jesus out of me"*. CL5P2 said, *"I do not attach religion to going to church. All those rituals people feel they have to do…we really like walking on Sundays* [translated from Afrikaans]*"*. CL5P5 noted, *"I am unmarried. I am gay. When I was in x, I met a younger guy…".* CL5P6 prefered spending time with women, *"Well, when you are a young man, or a boy growing up, you're supposed to spend a lot of your time with male figures sort of to shape you, so you can learn. So, you don't really spend time with your aunts. Actually, you're*

frowned upon if you spend quite a lot of time with your aunts". CL5P7 grew up in Italy, but wanted to live in a mixed-race community, *"But for the very first year my first house in Cape Town was in Athlone which is considered a coloured township. It was a place that I actually liked because I could see, in the evening, the women taking chairs and sitting outside in the street, and the children playing in the street. So, that was the kind of thing that I liked"*.

They often expressed cultural compassion and openness. CL5P1 noted, *"There was also still, at this stage, there was a lot of white privilege",* and currently he spends a lot of time on the streets to connect with those forgotten or ignored by society, *"I spend a lot of time on the streets. I've used several different strategies to ensure my safety. I know the majority of the homeless community that is in this area. I've spoken with them. I know a little bit of life history"*. CL5P3 said, *"Everybody has their place under the sun…I struggle with that* (inequality) [translated from Afrikaans]*"*. CL5P4 noted, *"I can say 'better' means success, … to grow and be educated, see the world and how other people live"*. CL5P5 showed openness to meeting extra-terrestrials, *"I hope there are aliens. It will be a different culture, people and experiences. Hopefully they are more intelligent than the average person we have here* (on earth) [translated from Afrikaans]*"*. CL5P6 described attending cultural festivals, *"… I went to see jazz at Alliance Francaise"*. CL5P7 mentioned being passionate about inclusivity; *"We need to make it more inclusive. I think it's pretty complicated* (living in South Africa)*"*.

5.6.3.4 Consequence: Connected to broader world experiences

A consequence of their openness and exploratory worldview is that they feel connected to broader world experiences whether those experiences are positive or negative in nature. It means that they might feel easily impacted by universal events.

Connected to broader world experiences dimensions

- ➔ Positive experiences
- ➔ Negative experiences

Figure 82: Universalism category consequence dimensions

Connecting to the broader world emerged as leading to positive experiences. CL5P2 described searching for hope when there are challenges, *"It helps to remain positive even with everything that goes on around us. That there is something to believe in, there is hope, because I see so many people that feel hopeless and who feel there is nothing to live for* [translated from Afrikaans]*"*. CL5P3 mentioned choosing physical connection, *"I will easily give somebody a hug* [translated from Afrikaans]*"*. Every day was described as a new opportunity for CL5P4, *"You can have the same Monday, but it's not actually the same …"*. CL5P5 described the positive experience of equality, *"I have a way with children. I do not talk down at them and I consider them as my equal. That has meant that the child* (adopted) *is very intelligent* [translated from Afrikaans]*"*. Positive experiences shaped his worldview, *"They've* (his mother and aunts) *also shaped me a lot because I spent most of my school days with them because my father wasn't really around all the time".* These positive experiences were expressed as being comfortable with

having multiple identities for CL5P7, *"The first thing that I want to say is that I'm not quite comfortable with identity as a singular. I'd rather say 'identities' because I am many things"*.

However, a deep and broad connection also leads to negative emotions experienced for the *Explorer*. CL5P5 said, *"Our country is going through hell at the moment* [translated from Afrikaans]*"*. CL5P1 continued, *"Unfortunately in South Africa and most Third World and First World countries, people are so obsessed with the here and now, they're not thinking about the bigger picture"* and CL5P2 described this lack of big-picture thinking, *"…if you look at politics, those guys are more interested in themselves and what they can get out of term in power. They don't neccesarily consider how they can serve the country and it's people* [translated from Afrikaans]*"*. CL5P3 described facing inevitable death, *"My husband is a lot older that I am…that means I think that I might lose him at some stage, I don't want that, but it is a reality* [translated from Afrikaans]*"*. CL5P4 said South Africans cling onto victimhood, *"What I actually notice in most South Africans is we still blame the past for everything. If anything is not going right people say 'It's because of the past. It's because of Apartheid. We're still oppressed"*. CL5P7 noted, *"I'm not really confident that there is a bright future for humanity. I think that we will probably be extinguished pretty soon, self-inflicted".*

5.6.3.5 Process: Making a difference

A consequence of their universal worldview and connectedness is that they actively try to make a difference individually and on a societal or community level. This the process that they use to participate in the world.

Making a difference dimensions

- ➔ Individually
- ➔ Society/community

Figure 83: Universalism category process dimensions

They described making a difference to individuals. CL5P1 said, *"I'd really like to change things. I don't know how though, and I think I've got to figure out how to do that. I think that's when I realised if you want to change this world, you have to change humans"*. CL5P2 said, *"I try to provide them* (students) *with leadership with the hope that at the end of the year there is one or two that can say they have learned something…more than just learned…but they they feel they have been enriched* [translated from Afrikaans]*"*. CL5P3 has a foster child, *"I have two stephchildren and a foster child that I love very much* [translated from Afrikaans]*"* and CL5P5 has an adopted child from a disadvantaged background, *"He sees me as his father and my dream is for him to come and live with me* [translated from Afrikaans]*"*. CL5P4 described making a difference through rising up from her background, *"My purpose in life, I'd say, is to be better, I think better than my background or my expectations that I had growing up. You know when you're growing up, looking at your background, you think 'Maybe, I won't be anything or anyone.' I think my purpose is to be better"*.

They also described making a difference more broadly in society or in their communities. CL5P1 said, *"…what's the next best way that I could feasibly interact with people? Ideally, mind-set changes society. I figured there was enormous power in art. I tried to do quite a lot of work with street kids. I very ambitiously started doing drawing workshops with kids on the streets…"* and *"So, I pulled out of working with those kids and now I work primarily with the stowaways* (refugees who stow away in ships from other African countries to come to South Africa)*"*. CL5P3 described the importance of charity work, *"I do lots of charity work, so my husband and I are involved at an orphanage* [translated from Afrikaans]*"*. CL5P4 plants trees and spoke to people about what is happening in the world, *"We can plant more trees, recycle more, and be friendly, like make other people be aware of what's actually happening; communicate more about it"*. CL5P5 described reading stories to children; *"In the afternoons I ran children groups where I read stories to them* [translated from Afrikaans]*"*. CL5P7 noted, *"In the last 5 years, I've been working for a big company doing research. We do research on financial crime. It's something actually that helps".*

5.6.4 Interconnected with nature category

The *Explorer* demonstrated an interconnected life experience with nature. This unified view means that they interpret crimes against nature as both witness and participant. This interconnected worldview and experience is a consequence of their biophilia and experienced generational consciousness.

5.6.4.1 Functional pillar: Interconnectedness

Interconnectedness is the functional pillar. The *Explorer* typology feels connected to nature and because of this interconnectedness, they often feel painfully impacted by the things which influence nature.

Interconnectedness dimensions

- ➔ Closeness to nature
- ➔ Painful relationship with nature

Figure 84: Interconnectedness with nature category functional pillar dimensions

Explorers described feeling a closeness towards nature. *"Everything has an energy to it, for me. What energies you put out; you get back. It's a staunch belief and vice versa with nature. This world we live in, if you give out good, you get back. But I don't give enough good with regards to nature and I don't get enough back as a result"* (CL5P1). CL5P2 described feeling impacted by anthropocentric destruction, *"Everything to do with the earth is part of nature, the soil, the plants, the animals, water, air…everything. What is not part of nature is, I cannot say humans because we are sort of part of nature, but it is more what we do to nature that is not part of nature. We introduce artificial things that disrupt nature and that bothers me* [translated from Afrikaans]*"*. CL5P3 said, *"Nature is a big integral part of our lives"* and for CL5P4, *"Because I think everything was created to be on earth to form like one big piece"* and this integration means a sense of being dependent on nature, *"Without nature I cannot exist. Out of respect I need to nurture nature* [translated from Afrikaans]*"* (CL5P5). CL5P6 agreed, *"I feel sort of interdependence. Even though, humans are more on the destructive side, but I feel like it's survived,*

like we need each other". It is about feeling a part of something bigger, *"It* (nature) *makes you feel more connected, probably. That appeals to me because it makes me again feel part"* (CL5P7).

Their relationship with nature was often defined as painful because of their affective involvement. CL5P1 experienced negative emotions when seeing injustices towards animals and nature, *"It's the animals in captivity that gives me heebie jeebies of note"*. He also described the emotional pain when witnessing children from a disadvantaged background burning a rabbit alive, *"They're kids that obviously had no one to talk to and they had parents who didn't give a shit about them. You learn something, you pass it on. One memory"*. CL5P3 noticed how others ignore nature, *"People don't talk about how beautiful nature is. You won't come in to work and with people talking about their experiences of nature* [translated from Afrikaans]*"*. CL5P5 described being emotionally impacted by fires, *"You also get fires which are unnessary and that should be avoided* [translated from Afrikaans]*"*. CL5P6 felt responsible for others' destructive behaviour, *"It won't really take much effort, I'd do it. Even back at my complex if I see there are papers by the fence floating around, I feel compelled to pick them up"* but there is a sense that nature does not really need humans, *"Definitely humans should be responsible for nature. We do need nature, nature does not need us" (CL5P7).*

5.6.4.2 Micro condition: Crimes against nature

Explorers are both witnesses and participants in harm caused to nature and this is an experience that is relevant to the individual context, and therefore forms a micro condition. They place the burden of humanity on themselves (harm towards self).

Crimes against nature dimensions

- ➔ Harm towards nature
- ➔ Harm towards self

Figure 85: Interconnectedness with nature category micro condition dimensions

The *Explorer* perceived humans as responsible for damaging nature. *"I haven't really done the maths on it, but it's blatantly obvious to see that the vast majority of issues we have in society are from a lack of education, and one of the primary elements of that is over-breeding. There are too many people in this world, and its not working and there are too many sort of cultural obstacles to counter that"* (CL5P1). CL5P2 said, *"I feel a little anxious and worried, more about what happens to nature because of humans…* [translated from Afrikaans]*"*. CL5P3 felt, "*Well it is humans…damaging nature with the ozone layer…air pollution, earth pollution…* [translated from Afrikaans]*"*. CL5P4 noted, *"I think we are actually destroying nature to be like more modernised and we're changing nature to put everything into technology. It's bad"*. CL5P6 said, *"Whenever I bring man and nature together, I sort of see destruction"*. CL5P7 continued, *"This makes me think of, where I read recently, probably last month or so, where it was a shark or a dolphin, or something that was beached, but it was still alive but because people wanted to take pictures actually the thing died because they did not help"*.

Harm towards self was the condition of taking responsibility for problems in the world. CL5P1 said, *"Look, I'm under no illusions to the impact that I'm having on the world, like no illusions whatsoever"*. CL5P2 said everybody is part of the problem, *"Unfortunately I see myself as contributing to the disturbances because of lifestyle* [translated from Afrikaans]*".* CL5P3 continued, *"I think yes, my person life, I think we contribute towards pollution because of lifestyle. You feel trapped into polluting* [translated from Afrikaans]*".* CL5P4 felt guilty, *"I think I'm not recycling enough. I think that is the part I'm guilty about. There are no procedures, or ways to promote it around where I stay. So, I can say it makes me ignorant at some point".* CL5P5 felt similarly, *"My housing arrangement makes it difficult to recycle. I can no longer do it (on the same scale as I used to)* [translated from Afrikaans]*"*. CL5P6 continued, *"I still feel as a human being I'm playing a destructive part towards nature"*. CL5P7 said, *"We go to National Parks. At the same time, while we're actually there to reconnect, to get there, we have to consume resources that pollutes the environment".*

5.6.4.3 Process: Generational consciousness

The process triggered by connectedness and interconnectedness is generational consciousness. This typology described an environmental consciousness obtained and relevant in both childhood and adulthood.

Generational consciousness dimensions

- ➔ Childhood
- ➔ Adulthood

Figure 86: Interconnectedness with nature category process dimensions

Early life experiences influenced their environmental consciousness, *"I've got quite a tricky one in South Africa with invasive species…I suppose that comes from my father"* (CL5P1)*. CL5P2 said, "I think my dad grew up like that and he passed that on, so now we have that consciousness (about the value of water)* [translated from Afrikaans]*".* CL5P4 noted, *"Because I think our children and our children's children won't actually be able to see the nature that we saw growing up because we are destroying the beauty part of it"*. CL5P5 described a memory that he still thinks of as an adult, *"There is a place in Magoebaskloof, near Graskop in Tzaneen's direction, there is an indigenous forest where I saw a red and white mushroom for the first time in my life* (as a child) *…like the ones you see in fairytales* [translated from Afrikaans]". CL5P6 continued, *"Especially, like growing up in the village, … things like milking a cow or if it was harvesting season, we gathered the cows/the bulls, tied them up so we could plough the fields, herded cattle"*. CL5P7 spent her childhood in Italy and was impacted by the Chernobyl disaster, *"What I remember, Chernobyl is in the Ukraine, it's quite far from Italy but we were told for months not to eat salad, not to eat anything that had big leaves. It was quite a scare".*

Childhood environmental experiences affected their adult life. CL5P1's awareness of empty oceans has influenced him, *"I'm more than happy to eat game. I struggle with fishing. Now, I don't do sea fishing much anymore at all because I can't really justify it".* Growing up he felt differently, *"Growing up fishing,*

I didn't see a problem with killing animals, as long as I put its body to good use, I could justify that action". CL5P2 described water consciousness, *"So, water has always played a role and that you need to look after things and not take anything for granted* [translated from Afrikaans]*"*. CL5P4 continued, *"I think plant more trees because there are a lot that are being cut every day"*. CL5P6 described trying to live plastic-free; *"I've been doing, for a couple of years, not buying plastic bags. I rather opt out. I carry it by hand. I know I look stupid; people look at me weirdly, but I don't have any plastic bags in my house because I'm going to throw them away"*. CL5P7 does not eat animals, *"I'm vegetarian, and I'm trying to eat locally produced stuff"*. CL5P5 acknowledged a difference between use and abuse of nature, *"We are here to use but not abuse. We have to be responsible users* [translated from Afrikaans]*"*.

5.6.4.4 Action-interaction: Biophilia

Due to their interconnectedness, ability to witness the crimes against nature and their generational conscious they interact (action-interaction) with the world and nature through biophilia. Biophilia is an inherent affinity of human beings with the natural world according to biologist E.O. Wilson (Kellert & Wilson, 1993). They are able to see and and show concern for the micro parts of nature. They feel nature is a living being and godly and that a healthy relationship is one characterised by reciprocity.

Biophilia dimensions

- ➔ Connects with micro-nature
- ➔ Nature alive
- ➔ Nature as godly
- ➔ Reciprocity

Figure 87: Interconnectedness with nature category action-interaction dimensions

The *Explorer* described connecting with micro-nature through awareness of the complexity of invasive species, seeing the value in ants, observing bird nests, worms and contemplating about the cosmos. CL5P1 said, *"So you'd actively gun to try and squash Indian mynahs not only because they're invasive but also because they're wily mother fuckers"*. CL5P2 said, *"Ants actually do very good work and they should be left alone* [translated from Afrikaans]*"*. CL5P3 described, *"I see two birds sitting in a nest and you (sic) are mesmerized by the beauty. Those are the emotions that get to me* [translated from Afrikaans]*".* CL5P4 said, *"I include the sun, stars, the moon* (in nature)*"*. CL5P5 added, *"I am very interested in the cosmos and what is going on out there".* CL5P7 included atoms in her concept of nature, *"Well probably atoms. We are of the same material in an ample sense"*. CL5P5 said, *"I had wurms and I tried to do everything as natural as possible with very limited disruptions to the soil* [translated from Afrikaans]*"*. CL5P6 described a sensorial connection; *"I'd say hiking with my father and my brother… boys hiking and skinny dipping in the river"*.

Explorers described experiencing nature as alive. They described nature as a mentor, being able to feel pain, the ability of nature to heal, *"mother nature",* and process of recovery for nature. Nature represented a mother for CL5P6, *"The tree represents Mother Nature, to me – strong, resilient, holding a lot of wisdom in it, years and years of wisdom"*. CL5P1 said, *"It shows you how you can live, how*

things can work". CL5P2 noted, *"You see it in countries where there is starvation, there is no sign of nature except sand* [translated from Afrikaans]*"*. CL5P7 continued, *"But, I think that nature and the planet will recover eventually, probably not in the same balance that it is in now that we know of it but it will just carry on without balance".* CL5P3 said*, "…everything in nature is new life. It goes from death to rebirth, to death to rebirth* [translated from Afrikaans]*"*. CL5P4 explained, *"I think so* (nature can feel pain)*, although it can't talk. I think so, because you can actually see, I will make an example with the ground. You know when the ground is like well-nourished and well taken care of you can see it. But, if it's not, then you start seeing soil erosion"*. CL5P5 said, *"Nature can heal itself…* [translated from Afrikaans]".

Nature has spiritual value. *"It's* (nature) *the ultimate. For me it's perfection. It's perfection in relation to what we as society do, how we live"* (CL5P1). Nature loses its godliness when humans intervere, *"This shows untainted nature without human interference* [translated from Afrikaans]*"* (CL5P2). CL5P3 described nature as more than just elements for our survival, *"All those things are godly gifts and I value that quite severely* [translated from Afrikaans]*".* CL5P4 continued, *"This one* (enabling card) *I think it has some sort of religion attached to it. I always feel free and refreshed around nature, and nature is another way of me realising that 'Okay, God is there. God actually created this'"*. CL5P6 described nature as a spirit, "(Nature) *represents the people bowing, which is how I feel about nature. I love it. I hold it in high regard.* CL5P7 described nature as timeless as a religious figure*, "It gives a sense of timelessness to the things that have always been there, will be there, even if you might mess it up"*.

Reciprocity is a key element that described their relationship with nature. CL5P3 said, *"We have a responsibility towards nature and vice versa* [translated from Afrikaans]*".* CL5P5 described a nurturing relationship, *"What I see here is something which is core to my personality, the nurturing part and this guy is obviously busy to plough or to plant and he is busy fixing the world* [translated from Afrikaans]*".* CL5P6 continued to say that nature is nurturing, "(Nature) *in its broad sense is nurturing or caring"*. *"It* (nature) *grounds you"* (CL5P1). CL5P2 said, *"I think it brings balance into my life, because you can so easily be controlled by technology and other stuff and then you forget about the effect nature has on you…it makes you feel calm and positive* [translated from Afrikaans]*"*. CL5P4 described nature as peace of mind, *"I believe that nature is there for humans to take care of, and make sure that it stays there, it stays the same, it doesn't change. I'd say nature alone, it brings some peace of mind"*. CL5P7 described reciprocity, *"It shows that the human cares and appreciates it, yet it is not enough to have a positive impact"*.

5.6.5 Climate change as changing relationship with nature category

Climate change is a process of awakening for *Explorers*. It is changing the close and interconnected relationship that they have with nature. Due to the awakening, there is a process of adaptation for both nature and humans.

5.6.5.1 Consequence: Climate change is changing the relationship

As a consequence of their biophilia and connectedness they feel that climate change is shifting the relationship that they have with nature. They see climate change as a broad scale process of awakening which leads to a need for both humans and nature to adapt.

Climate change is changing the relationship dimensions

- ➔ Causes an awakening
- ➔ Adaptation for nature
- ➔ Adaptation for humans

Figure 88: Climate change as changing relationship category consequence dimensions

The *Explorer* described humanity as going through an awakening due to the changes in nature. CL5P1 said, *"It is all doom and gloom, but I think it's necessary. I think when people start to go hungry, when there's not enough food, when these big issues start to come to the fore, and you're forced into it, you're forced to acknowledge it, people from all strata's of society are forced to acknowledge it"*. CL5P5 noted, *"We have the internet, we have television and all those things, and we can see things just a bit faster with the news…it seems very real what we are seeing* [translated from Afrikaans]*".* CL5P6 said, *"… where a lot of farmers were struggling because of the drought which was severe. Obviously, droughts happen, but I think the pattern there was that it happened in Bloemfontein, KZN, the Eastern Cape, and a bit of the Karoo where it's really, really dry. I'd say that probably was a response from climate change, the fact that it happened on such a geographical scale and it also affected food production".* CL5P7 continued, *"But I think because of the frequency and the severity of this phenomenon, I think it's actually enough proof of actual climate change"*.

They perceived nature as going through a process of adaptation. *"I think its nature sort of trying to find its balance, being forced into balance"* (CL5P1). CL5P2 noted, *"For example I saw an interesting program the other day about how the sun is busy developing. It is taking millions of years, but eventually the sun will be come so hot that it will destroy the earth anyway* [translated from Afrikaans]*".* CL5P3 described the adaptation nature is going through, *"They say the earth is becoming warmer and there is less…the entire cycle is to do with…there is more snow that is melting…* [translated form Afrikaans]*".* CL5P5 said adaptation is needed, *"Climate change is the warming, and whatever is happening is natural processes that humans will have to adapt to. It* (adaptation) *is not something we have control over* [translated from Afrikaans]*".* CL5P6 described adaptation as a continuous process, *"In any case, nature is always in flux, it will never be constant it's always changing, adapting"*. CL5P7 said adaption is not spontaneous, *"Well, there are things that we can do to contain the problem, but what I'm always thinking about, Fukushima, even now is that all the fish, if there are radioactive fish, then it will be in the food chain. You cannot just take it out".*

They believed that adaptation is necessary for humans as the climate changes. *"I don't think there is a way out of it. I think humans are going to have to learn to adapt. Humans are going to have to learn to mimic nature"* (CL5P1). CL5P3 continued, "Summers have changed, rainy season has

changed…[translated form Afrikaans]". CL5P4 felt that humans might need to adapt more quickly, *"Climate change – it means that if the climate will change from what it is now it could actually harm the human because we are used to the current climate conditions. If it becomes extreme to what it is now then we might not actually be able to survive"*. CL5P6 added, *"Climate change…is a natural process and we will have to learn to live with it* [translated from Afrikaans]". For CL5P6, humanity could adapt, *"Well humans are advanced. We can create or sustain our lives from the most basic thing or create at least a living"*. CL5P7 noted, *"It definitely makes me feel that it's quite an irresponsible thing to have children now, because what kind of world are we leaving to our children? That's definitely not the thing that I would like to leave to someone else. It's interesting because even some colleagues of mine are saying the same thing although they come from different backgrounds".*

5.7 Typology 6: The Hedonist

"So, I don't have a ten-year plan, or I don't have a long-term goal, or ambition" (CL6P4)

"When I get excited, I live in the moment" (CL6P1)

"Recently, my gran moved in because she got quite sick. So, now she's come to live with us until the end of her days, which is taking a little bit of the pressure off my mom's expectancy on me to form a solid relationship with her, because now she's close to her mom" (CL6P3)

5.7.1 The Hedonist: Categories, Properties and Dimensions

The identity-inspired label that described this typology is *The Hedonist*. Four categories emerged namely hedonistic, struggles with outside world, poor relationship with nature, and apathetic towards climate change. Being a hedonist automatically suggests a focus on the self and pleasure. This explains the poor relationship with the outside world, nature, and climate change. Climate change is not a topic that is pleasurable to deal with and therefore it makes sense for this typology to exclude it from their cognitive and emotional range. Within the four categories there were 14 properties with associated dimensions. Figure 31 shows how each property plays a role in the typological system as a functional pillar, micro condition, macro condition, consequence, or process.

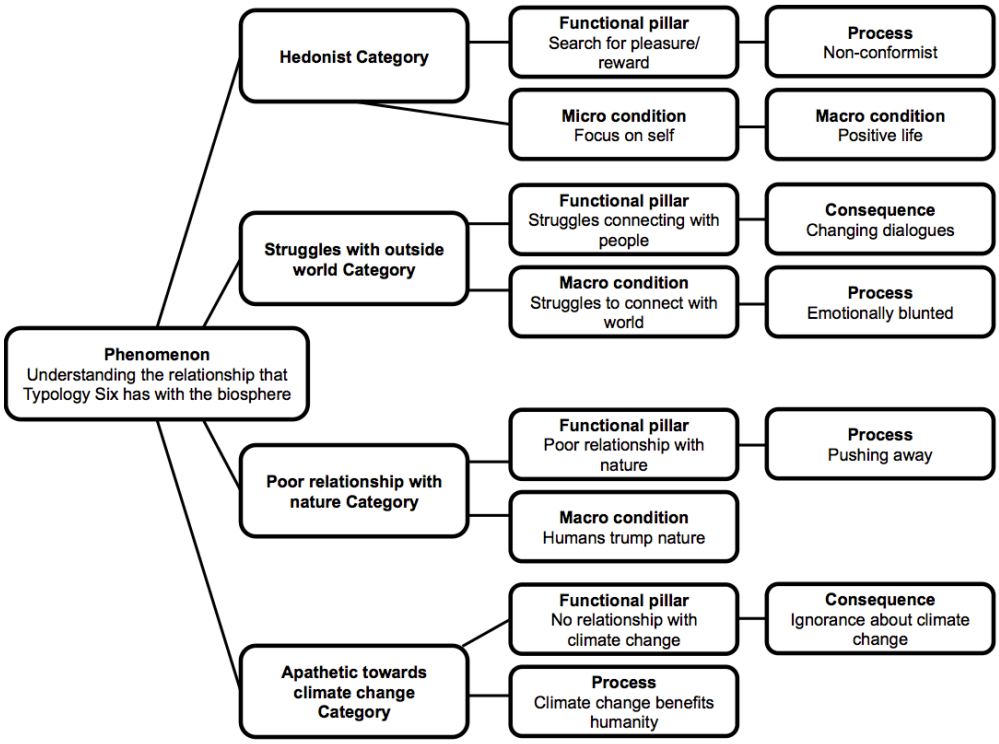


Figure 89: The theoretical structure for the Hedonist typology showing categories and properties

5.7.2 Hedonist category

The *Hedonist* primarily focuses on themselves and tends to get involved in activities that provide personal pleasure and/or reward. This self-gratification leads to impulsivity and a lack of desire to conform. *Hedonists* express resilience in that although they might have experienced some challenges, their emotional disconnect means that overall they feel life is generally more positive than negative.

5.7.2.1 Functional pillar: Search for pleasure/reward

The search for pleasure/reward forms the functional pillar of the *Hedonist* as this drives the typological system. They tend to describe pleasure-seeking as either short-term or long-term oriented. The *Hedonist* easily sacrifices long-term gain for short-term pleasure, but in some instances, they could sacrifice short-lived happiness for long-term satisfaction. This suggests that climate change is a challenging topic as there is no short or long-term pleasure in changing behaviour. With a lack of attractive rewards, this typology is likely to focus on self-enhancement opportunities rather than those that require selfless action.

Search for pleasure or reward dimensions

- ➔ Short-term
- ➔ Long-term

Figure 90: Hedonist category functional pillar dimensions

The *Hedonist* described a focus on short-term pleasure or rewards. This is expressed through living in the moment, being outgoing, living for themselves, having no long-term plans, spontaneity, and enjoying instant gratification like shopping. CL6P1 said, *"When I get excited, I live in the moment".* CL6P2 talked about having a focus on fun and easily losing interest, *"I was very out-going, especially when I went to a technical college, we were wild, we were very wild. I never really focused on school. So, I just lost interest*. *I really didn't have a purpose, a direction at that time because I was just living for myself".* CL6P4 described having a short-term focus in life, *"So, I don't have a ten-year plan, or I don't have a long-term goal, or ambition".* This added to the general stance of living in the moment when CL6P5 described himself as *"slightly spontaneous"*. CL6P6 described her life as focused on the current moment when she said, *"Weekends is going out, shopping, cleaning, shopping, and bed".* The short-term focus provides individuals with some internal resilience, as they are unable to think about long-term crises.

They described occasions when long-term rewards outweigh short-term pleasure. These situations are likely to tap into values like power. For example, working longer hours to earn more money and then being able to go on an exotic holiday. CL6P1 described sacrificing short-term pleasure for monetary gain, *"But, in exchange for the money, they kind of took away my life".* CL6P1 described having a habit of jumping between jobs when he loses interest or when things do not go his way. CL6P2 described a change in her short-term approach to life after she got married, *"I just got to settle back when I met my husband. Then, that's when I started thinking 'Now, I should be focused now and change'".* CL6P3 described having to weigh up long-term career opportunities with what he actually wanted to do as an architect, *"When you go out, it's hard to actually try and get into an office that does what you want it to do because of job competition and all sorts of things, like that".* CL6P6 aimed to have a holiday in the future, and that is what she is focused on while not enjoying her job, *"I think I deserve a holiday out of Cape Town, that's all".*

5.7.2.2 Micro condition: Focus on self

The value of self-enhancement supports the focus on the self (the complete opposite of typology 5). They actively navigate their lives to ensure that they get the best out of experiences and therefore it forms a micro condition. Since the self is their priority, they exclude anything that does not enhance the self or provide pleasure.

Focus on self dimensions

- ➔ Navigating own experiences
- ➔ Value self

Figure 91: Hedonist category micro condition dimensions

The *Hedonist* described being focused on navigating their own experiences. CL6P1 described control as a choice, *"Like, one of my favourite sayings, … 'Choose what it is that you want to indoctrinate yourself with'"* (CL6P1). CL6P2 described managing life with the idea of what it is that she wants to obtain, *"I recently started studying to get more things"* (CL6P2). Their focus was on their own experience,

"I don't like it when things go out of control, when you have no say in something, and you just have to accept something" (CL6P3). This need for control could also lead to fear when control is lost, *"I guess that's what I'm scared of most, people dictating, not people, but being dictated to in terms of how things will work, or how things will run, or being unable to affect something"* (CL6P3). CL6P4 said, *"Although, I'm a control freak myself; I think I'm very tolerant to difference".* CL6P5 described the need for control in the context of the need to understand when he said, *"In terms of materialistic stuff, I've always been sort of a breaker because I wanted to know what went on inside there, how does it work".*

They valued themselves within the context of potential and ambitions. *"My mission in life, right now, is literally these two things: to write a top ten best-selling graphic novel and the* (other) *one is to achieve R10 million worth of assets in rental property"* (CL6P1). CL6P1 described money as a gateway to pleasure and freedom, *"…it is important for me to make money, but I need people to understand how I view money"*. CL6P2 said, *"I feel, even though I do nonsenses, I must get praise".* CL6P3 noted, *"Once I leave here, I'd like to think I'm not going to just become a mindless architect and do the same thing for the next 40 years"*. CL6P4 confirmed that value is translated into drive, *"She's very much 'the universe will provide', whereas I'm quite driven"*. CL6P5 described his own value and potential, *"For a very long time, I had recurring dreams of being able to fly where I would, in the dream, run and then I would jump and just not come down… what those kinds of dreams mean is that it currently relates to a sense of untapped potential"* (CL6P5). For CL6P6 untapped potential translated into wealth and pleasure, *"I would like a better paying job; have my matric; be able to afford holidays, going away".*

5.7.2.3 Macro condition: Positive life

Positive life is a macro condition because it is a broad scope category that describes the general context in which this typological system functions. The positive feedback loop created by challenges is countered by the negative feedback from support experienced. Both the *Hedonist* and the *Disconnected* have a focus on the self but the manifestation of self for the *Hedonist* is not because of experiences like those described by the *Disconnected*. *Hedonists* described strong support structures even though they might still have challenges in their lives.

Positive life dimensions

- ➔ Challenges in life
- ➔ Supprt in life

Figure 92: Hedonist category macro condition dimensions

Participants described common challenges experienced such as a mother that worked long hours, having a poor relationship with their father, growing up in a poor neighbourhood, or feeling pressured to meet family expectations, but none experienced psychic traumas. *"My mother worked a lot. She worked very long hours"* (CL6P1). CL6P2 described a challenging relationship with her father, *"I would sometimes go, maybe once a month, to see my dad. We never really had that close relationship until we were older".* CL6P3 described growing up in a poor neighborhood, *"I've grown up in, you can call it, sort of like, I wouldn't say a poor white neighbourhood, but it wasn't obviously very affluent".* So did

CL6P6, *"Well, we come from a, how can I say, not rich, not well off".* CL6P4 described family challenges, *"My one brother is somewhat estranged from the family"*. CL6P5 described distant relationships that he is unconcerned about, *"I haven't seen my cousin in six years and now my mom is disappointed that I don't want to go to his wedding"* (CL6P6).

This typology described having solid support structures in place such as living in a close-knit community, a supportive grandmother, having fun while growing up, a loyal partner, and a well-read mother. CL6P1 often spoke about his supportive family, *"I lived in a very close-knit community. Like, my uncles all live literally like next-door – uncle, uncle, uncle, aunty. My whole family was literally there, so I never had to go out, or whatever".* CL6P2 spoke about her protected upbringing; *"I grew up in Alex, with my granny. She did everything for me here".* CL6P3 described childhood as fun, *"So, it was a lot of fun growing up, and that kind of thing".* CL6P4 spoke of her experience of love growing up, *"I grew up in a very loving, generous, or spirited type family"*. CL6P5 spoke about his mother, *"I grew up with my mom. She's a librarian"*. CL6P6 described her supportive relationship, *"He'd* (husband) *will probably say the same - that I'm loyal, I'm always there for him, and I'm loving…spoiling"*.

5.7.2.4 Process: Non-conformist

They struggle to form meaningful relationships with others, and tend to justify this through their inability to fit in with the status quo. The process is seeing themselves as different from other people in the way they think and the way they live their lives.

Non-conformist dimensions

- ➔ Different thinking
- ➔ Different living

Figure 93: Hedonist category process dimensions

They perceived themselves as thinking idiosyncratically. *"What I'm looking at doing is, it's kind of like a socialist system. It's, again, a weird idea that I have"* (CL6P1). CL6P1 continued, *"Life and death have been in love for longer than you have words to describe. Life sends us countless gifts to dare and death keeps them forever"*. CL6P2 said, *"When I look at the world, I see it in a different way because mostly there are different challenges in life".* For CL6P3 that meant having the ability to look at ideas or experiences from different perspectives, *"…it's really about keeping things open to interpretation".* CL6P4 re-interpreted the concept of kindness, *"So, for me kindness has got nothing to do with religion, for example. I know you would have seen that statement – was it the Dalai Lama who said 'My religion is kindness'? So, for me it's not a religious thing at all. It's literally, it's just having sensitivities towards your fellow man"*. CL6P5 described his anti-capitalist views, *"I'd say, to a small extent, I feel anger, simply because the way that technology develops, it's not small because it is mostly driven by capitalistic society. So, the main goal isn't sustainability, its profitability, and that's just stupid".*

They described themselves as living differently. CL6P1 described the lack of motivation to work, *"It's like Generation X kind of, the fact that they were working was good enough for them".* CL6P3 described having different cultural experiences, *"Then, when I went to x (school), the one in Ballito, where it brings you to this whole different level of different classes, you know just different lifestyles, and doing it through that process I was actually exposed to something that I wasn't exposed to before".* He continued to describe himself as non-typical, *"So, I think that plays quite a role and I like to think I don't inflict or project the typical white guy sort of tendencies, particularly through things like music or dress codes and stuff like that".* CL6P4 talked about reigniting her rural roots as a white female, *"I still love going back to the Eastern Cape. I go back quite regularly because it reminds me of how important those roots are and how grounded and authentic the people are in the Eastern Cape".* CL6P5 described being unconventional, *"Like, you've all seen those little pictures of the little tree growing up through concrete. I will face the challenges as they come and just keep going and find a way of getting through it".*

5.7.3 Struggles with outside world category

They struggle to connect with the outside world, including people. As a consequence, they attempt to seek connection with the world and others through changing the way in which they communicate. Furthermore, the process they use to deal with these phenomena is emotional bluntness. It is not clear whether the emotional bluntness that emerges is conscious or biologically based.

5.7.3.1 Functional pillar: Struggles connecting with people

Struggling to connect with people is a functional pillar of this category. Although they had good support structures in their lives, they seemed to struggle forming meaningful relationships. This struggle is with both family members and others.

Struggles connecting with people dimensions

- ➔ Family
- ➔ Others

Figure 94: Struggles with outside world category process dimensions

Some struggled with family relationships and described not being close to their mother but feeling under pressure to connect or just seeing the father as a source of financial security. These relationship struggles did not seem to have a negative emotional impact on them. CL6P2 said, *"I never had that very close relationship with my mother".* CL6P3 described challenging relationships in his household, *"I would say I had a better relationship with my dad than my brother did, and then vice versa, him with my mom".* He continued to describe dread from having his mother expect him to work on their relationship, and subsequent relief when his grandmother moved in with them, *"…my gran moved in because she got quite sick. So, now she's come to live with us until the end of her days, which is taking a little bit of the pressure off my mom's expectancy on me to form a solid relationship with her, because now she's close to her mom".* CL6P5 described his emotionally absent relationship with his father, *"So, instead of actually*

saying 'It's my dad, and I want to spend time with him', it was 'That's where I was going to get some money'".

Apart from struggling to connect with family, they also described struggling to connect with others. CL6P1 described struggling to connect, *"The break from my home living and varsity life, it was a big culture shock for me"* and he continued to say, *"it may have blurred, or skewed my vision of what was happening at the time, the way I experienced varsity and, maybe even my relationship, or lack of relationships with women"*. He also said, *"I love and hate people. It's hard not to hate them, and it's hard not to love them".* CL6P2 described avoidance behaviours, *"You know, there are days where I will just be at home, and someone would knock, and I will act as like there's no one at home. I will just sit and keep quiet, and I'm living in a very small house. So, like when you pass, there's a window, so I will see, okay, someone is passing. So, when they come and knock, I just turn down the volume and keep my phone on silent because that day I don't want friends, I don't want anything, I just want to be my own and be at home".* CL6P5 noted, *"I'm mostly a bit of a loner".* That meant not forming emotional attachments for CL6P6, *"For me, it's just take me as I am, I will take you as you, but if things come to a head we'll part ways"*.

5.7.3.2 Macro condition: Struggles to connect with world

Their focus on the superficial self, combined with their inability to connect with people, means that they are unable to relate to the broader outside world (including their own deeper inner worlds). This inability to relate to the broader world then functions as a macro condition because it has broad range impact for those they meet. They describe the world as inhospitable and therefore they desire pleasure at any cost.

Struggles to connect with world dimensions

- ➔ Outside world
- ➔ Inside / own world

Figure 95: Struggles with outside world category macro condition dimensions

They mentioned an unwelcoming world with no jobs, crime, and irrational human ideology. CL6P1 described challenges faced by the youth, *"We've got the degrees you know, but the jobs are not there, and the work isn't there".* He continued to describe how expectations of the world are left unmet by reality, *"I'm now thinking to myself if I went back and told my 20-year-old self everything I know now, I wouldn't have believed me. I honestly wouldn't have believed me!".* CL6P2 spoke of the need to balance work with school while younger, *"If I didn't go to school, if there were piece jobs, I would go do piece jobs".* CL6P3 described the outside world as an irrational manifestation of human paranoia, *"Through what I've studied, you find out the reasons why the whole thing about suburbia is people wanting their own space. They link things like suburbia as the reason that crime rises".*

Apart from perceiving the world as a strange place to live in, they described instances where they struggled with their inside worlds. CL6P2 battled with her fear of not being able to control situations, *"It's no longer that place we grew up with our uncles taking care of us living at home. So now, you're even afraid for them to touch your daughter because you're thinking something might happen. So, the world is no longer a safe place".* CL6P1 described his internal process of dealing with his parent's divorce, *"My parents got divorced just after matric. My father had gambling issues and my mother kept having to pay for that".* A similar challenge was described by CL6P3 where he had to restructure the way he viewed the world, *"A child of divorce, really, so there's kind of like the 'after divorce', parents split* (reality to deal with)*".* CL6P4 described being driven by an internal fear of losing control, *"…the first thing that comes to mind is I fear not being able to take care of myself when I'm old, which everyone laughs at me about".* CL6P6 described her inner experience of having adult responsibilities at a young age, *"I had to leave school earl to go and work..."*.

5.7.3.3 Consequence: Changing dialogues

A consequence of struggling to connect with people and the world means that they find other ways to connect through changing dialogues using art or technology. Communicating in this way is impersonal but functional for this typology as it assists them to form connections with others.

Changing dialogues dimensions

- ➔ Dialogue through art
- ➔ Dialogue through technology / reading

Figure 96: Struggles with outside world category consequence dimensions

They created dialogues through a creative process. Participants in this typology described creating dialogue through art. CL6P1 described painting and drawing, *"I sketch. I'm looking to move professionally into the comics direction".* CL6P5 also used drawing to create connections, *"I went to study graphic design".* CL6P2 tried to connect with the world through mass media, *"I went and worked for a local community radio station as a presenter … and produced my own show".* CL6P3 felt passionate about buildings and how they create spaces for dialogue without speech, *"I'm studying architecture. There is no real intermingling. So, I'm using visual arts, performance arts, and craft as a means of creating dialogue".*

They created dialogue through being recipients. They experienced dialogue through technology and/or reading. CL6P1 described the impact of movies and characters on him, *"I know I'm influenced by these people and I know I've been influenced by TV, the movies that I've watched, and I also understand".* He described technology, such as neon signs, as making him feel safe, *"…if I'm at the mall, I love big signs because they let me know where I am"*. CL6P4 described spending time reading, *"I like reading, but not necessarily reading novels".* CL6P5 described reading travel books in order to create dialogue with different places, *"I've been enjoying sort of travel books".* CL6P5 connected through gaming, *"I do play online games as well. Then, I usually spend about two to three hours playing games".* CL6P6 mentioned

the use of social media for dialogue and connection, *"Facebook. I'm 24/7 on Facebook. My boss said I must get a job at Facebook. I love interacting on Facebook".*

5.7.3.4 Process: Emotionally blunted

Their inability to connect with others and the world means that they perceive and experience themselves as emotionally blunted. The process they use to make sense of this is that they feel unable to connect emotionally and therefore they do not make emotional investments in their life. Emotional bluntness means having no feelings, no expectations and therefore no bigger purpose.

Emotionally blunted dimensions

- ➔ No feelings
- ➔ No expectations
- ➔ No bigger purpose

Figure 97: Struggles with outside world category process dimensions

They described having no feeling, a general state of apathy, and being closed off. CL6P1 described a constant state of alexithymia, *"I'm the type of person that needs to knock their head to really understand that I feel something because I don't know…a lot of people say I'm closed-off".* CL6P2 noted, *"…at work, when I came back after my fiancé's funeral and all, everybody was like sad, and they didn't want to sing, and all. I knew 'Okay, everybody is expecting me to fall down'. When I walked in, I was like this person they never expected… laughing, thinking…'".* CL6P3 described himself as emotionally indifferent, *"…my religious views now kind of go against my up-bringing. So, they were very Christian, and I'm very, I wouldn't say atheist, but apathetic".* CL6P5 described himself as unfeeling, *"I don't really care for that many things which unfortunately sometimes, includes people, and obviously that just makes it even more difficult to relate to them".* While describing her need to work at an early age, CL6P6 did so without any emotion, *"It was hard, but we got through it. We are still living. But otherwise I can't complain".*

They described having no expectations and commitment avoidance which links to their inability to form connections. They go through life expecting very little from others, placing their need for pleasure at the center of life force. CL6P1 described a lack of commitment to a job in the search for pleasure and reward, *"…my first job was at the Spur in Kimberley and then the bank, and then back to Spur, and then again back to the bank".* CL6P2 told of having no expectations from the world or others, *"I don't really say 'I'm expecting this from the world, or the person'".* CL6P4 did not see any benefit in having children, *"I didn't have a reason to have* (children) *for myself".* CL6P5 described the avoidance of commitment as an experience of freedom, *"There's no people or someone saying, 'You have to go do this' or 'you can't go there'".* While exploring relationship with animals, CL6P6 described her culinary pleasure as her priority, *"I wouldn't survive becoming a vegetarian. I wouldn't survive if I don't eat chicken".*

Their generalised lack of emotion and hedonic tendencies meant that they felt there is no bigger purpose or deeper meaning to life. They did not believe in life purpose and did not attach value to anything. This

process ensures them the freedom to focus on only those aspects of life that provides individual pleasure and reward. CL6P5 said, *"…there's very, very little things that I attach real value to".* CL6P1 described his interpretation of life as something that is pointless, *"I kind of don't believe in a life purpose in terms of, it's like I don't think we were set out to achieve something".* CL6P2 described a lack of long-term drive, in order to live in the moment, *"I'm that person who would say 'You know what, I will take it as it comes'".* CL6P3 said it is important to not take things seriously, *"The lens through which I view the world – I try not to take things at face value".* CL6P4 saw no inherent purpose in having children, *"Children? Well, I guess, it's the sustainability of the world, and the ruin of the world, at the same time".*

5.7.4 Poor relationship with nature category

Following from struggling with the outside world is their poor relationship with nature. Their relationship with nature is characterised by a lack of affect, physical contact and cognitive manifestations in the context of anthropocentric beliefs. In order to deal with nature in this context, they push nature away through creating negative associations and redefining the concept of nature.

5.7.4.1 Functional pillar: Poor relationship with nature

The functional pillar is that they have no emotional or physical relationship with nature. They describe their relationship as superficial and they struggled to speak about nature during the interviews.

Poor relationship with nature dimensions

- ➔ No emotional connection
- ➔ No physical or cognitive connection

Figure 98: Poor relationship with nature category functional pillar dimensions

They expressed no emotional connection to nature and no ability to distinguish between what is undamaged nature and what is damaging to nature, *"For me, it's like I view plastic as natural. I know people say, 'you know what, it doesn't degrade, and it doesn't do this, and it's bad for the environment', I'm like 'rocks don't de-grade...'"* (CL6P1). CL6P3 said, *"I think overall I don't really consider what is not nature"*. Their relationship with nature came across as superficial in the context of CL6P6 who said that nature is to her like her manager at work, that never spoke to her, *"Let me put it this way – I've got a manager who I work for, and this morning he didn't speak to me and I thought 'What the hell did I do, to him?' One day, they're nice and jolly and the next day they don't want to talk to you for some stupid reason* (described her relationship with nature)*".* CL6P2 noted, *"I would say not much* (relationship with nature)*, … as I said, I'm not the person with the flowers and all, they all die. I don't really have that close relationship with nature".* CL6P4 said, *"I don't myself do too much gardening, which I think is a way of connecting to nature because everything I put in pots, dies. I try to be kind to nature, but it's probably at quite a superficial level"*. CL6P5 noted, *"I do think that we are connected with nature, but not in the metaphysical sense of 'Let's go all be hippies and hug a tree'".*

They described having no physical or cognitive connection with nature because they do not go outside, they struggle to speak about nature, they fear the night, and they prefer spending time in artificial spaces. CL6P2 attributed her lack of relationship to her lack of nature experiences during her childhood, *"I guess it has to do with how we were brought up because we were never really taken out just to say 'if you see a lion or something you have to run away' or 'like, you guys can go and touch it'. It was never really emphasised on us that nature was important".* She struggled to speak about nature during the interview, *"Nature nature… come…* (struggling)*".* CL6P3 associated green spaces with danger at night, *"Contentment in a green space, but maybe it's a little bit different if it's nighttime where there's a little bit more fear".* CL6P4 described her normal environment as built, *"So, when I'm working, a typical week will involve a lot of airports, I'm traveling a lot".* CL6P5 did not identify with being outdoors, *"… I don't describe myself as an outdoorsy type or something like that".*

5.7.4.2 Macro condition: Humans trump nature

The *Hedonist* views nature and animals as providing a resource and they perceive humans (themselves) to be more impressive than nature and therefore more valued. The broad scope of this property means that it functions as a macro condition.

Humans trump nature dimensions

- ➔ Nature and animals provide functional value
- ➔ Humans more impressive than nature

Figure 99: Poor relationship with nature category macro condition dimensions

They described nature and animals as providing humans with value. CL6P1 said, *"In exchange for the space and the water it* (a tree) *takes up, it gives off oxygen".* CL6P2 described nature as an economic tool, *"Like, for farmers, they gain from them, because they make money out of them".* She continued to describe the value of nature in its uses for humans, *"Like, from your trees and all, you get your books, you get your furniture, that's what it gives us".* CL6P3 extended this to domestic animals, *"Farm animals are just humans taking animals out of the wild and reinventing them for another purpose which is production. Nature is just an ultimate supplier of comfort even if we don't recognise it or realise it".* CL6P5 said, *"They* (animals) *play quite a big role in nature, simply because of the scale of farm animals that there are, to the extent that because we cultivate them to ensure our part of the food chain is maintained..."*. CL6P6 described consumption as natural when she said, *"Because from the beginning of time, we've being eating animals, chicken, different kinds of animals".* CL6P4 also perceived nature as a tool, *"The purpose of nature? Probably, what I said earlier in terms of it being sustaining, I suppose, functionally, so a provider of food, etc.".*

Humans were perceived as being more impressive than nature because humans can build buildings and use nature to their advantage. CL6P1 perceived humans as superior and being able to take over the role of nature, *"Now, a human being is capable of doing so much more. We can build cities. We can build houses. We can build forests".* CL6P2 described human superiority in our ability to grow another human, *"Nature – pregnancy. I feel it's like that human being growing inside of you, that process, feeling*

those kicks. I think it's a form of nature for me". CL6P3 described the human ability to learn and mimic nature, *"So, there's a lot that you can actually learn from nature. There's a whole thing about biomimicry".* CL6P5 described human superiority as a continuation of the separation between person and nature, *"In the 19th Century, there was a long time where it was man vs. nature. A lot of people like to separate humanity from nature".*

5.7.4.3 Process: Pushing away

They use psychological distancing as a process to ensure not relating to nature. Therefore, in order to deal with their dualistic views, they describe negative associations with nature. Due to this physical and emotional separation, they create new ways of perceiving nature (redefine nature) that fits with their dualistic and anthropocentric mental models.

Pushing away dimensions

- ➔ Nature is in the distance
- ➔ Negative associations with nature
- ➔ Redefining nature

Figure 100: Poor relationship with nature category process dimensions

Nature emerged as in the distance for *Hedonists* because they experience their lives as separate from nature. This means that they think in order to experience nature they have to travel far, like to a national park. CL6P2 said, *"With nature, I would say it's so peaceful, especially when you're used to staying in a township. So, when you go to those places like Kruger* (Kruger National Park)*, it's a different environment totally".* CL6P4 goes to Thailand to experience nature, *"So now as we're talking about this, this reminds me of… I say I don't spend a lot of time in nature on a day-to-day basis, but when on my Thailand trips, which is probably five weeks of the year I'm in Thailand, always at the exact same place, and that is literally being close to the earth of nature so perhaps that's my little dose I get".* CL6P6 noted, *"What I think of nature, and what I'd love to do is, I'd love to go see the volcanos in Hawaii"*. They described the experience of duality, *"So I do see it as together, but separate in the regard that yes, nature can be combined with technology, but at least where technology is now, there's a distinct line between this is technological, and this is natural"* (CL6P5). CL6P3 said, *"It really makes you question you're not just a separate thing".*

This typology described negative associations with nature; for example, that nature kills through rocks, wild animals are scary, nature is a nuisance, sharks are violent, and that nature can be bad. CL6P1 viewed nature as a killer, *"Rocks kill things, especially when there's an earthquake".* He continued, *"…from the time you're born nature is trying to kill you. It* (nature) *just throws stuff at me and it's like 'let's see what it's going to do'. That's literally my relationship with nature".* CL6P2 described fear of wild animals, *"They're part of nature but I'm so scared of wild animals".* CL6P4 also referred to violent aspects of nature when she said, *"It doesn't matter that it's a shark. It just looks violent, putrid and disgusting".* CL6P5 saw nature as being able to do bad things, *"I think it's important we acknowledge the fact that we aren't in control of everything and sometimes nature plays a role and sometimes it's a good thing*

and sometimes it's a bad thing". CL6P6 said, *"I don't actually like winter because it keeps you indoors".* CL6P3 agreed that nature can be an irritation, *"A lot of people can find nature to be a nuisance in terms of maintenance, in terms of what they attract, back to the bird and insect life".*

Due to their poor relationship with nature they redefined nature. They described nature as human-made forests, and that it is natural to be materialistic when living in cities. CL6P3, as an architect, valued green buildings as the new nature, but acknowledged that it is not perfect, *"It's like one evil to offset something else* (referring to green buildings)*".* He continued to describe comfort in being in human-made environments, *"Well, to me it's positioning myself within the environment, not necessarily the natural environment, but the built-in environment as well".* CL6P4 felt it is natural to lose touch with nature when in cities, *"I think when you live in the bigger cities, you can lose touch with authenticity and start getting very materially driven".* CL6P6 described an indirect link between humans and nature, *"We're part of the world, and the world is part of nature".*

5.7.5 Apathetic about climate change category

The *Hedonist* is apathetic towards climate change because they have no relationship with nature and therefore no relationship with climate change. Since the environment plays no role in their lives the consequence is that they show ignorance about climate change. The way in which they process this disconnect and apathy is to view climate change as beneficial.

5.7.5.1 Functional pillar: No relationship with climate change

The functional pillar is that they have no relationship with climate change except for perceiving it as a possible inconvenience. However, their natural state is that they are disconnected from climate change.

No relationship with climate change dimensions

- ➔ Climate change as an inconvenience
- ➔ Disconnect between self and climate change

Figure 101: Apathetic towards climate change category functional pillar dimensions

When probed, they described climate change as being a possible inconvenience because it will have an impact on cars, lungs, water quality, the economy and leads to too many people in places. CL6P1 is an Uber driver and felt that climate change is going to impact the cars he will be able to buy, *"So, it affects the cars that I get and the way they operate in terms of fuel emissions".* CL6P2 associated climate change with air pollution, *"Like, the air that we breathe, if it's not fresh air, then you get sick in your lungs".* For CL6P4 would influence water, *"I always think automatically of global warming, which has all kinds of consequences, in terms of water".* CL6P5 felt that climate change would have an impact on meat consumption, *"Either that or the way our economy is going now is that meat will just be too expensive that people can't buy it anymore and because no one is going to buy it, the demand is going to decrease and then the supply will decrease".* CL6P6 associated climate change with climate refugees, *"There are lots of people. There are too many. Don't allow foreigners in".*

There was a disconnect between the self and climate change. *Hedonists* made jokes about climate change, they described climate change as a consequence of human nature, and that they lived a good life, so are not impacted by, or concerned by climate change. CL6P1 referred to a movie laughing, *"…some of them make jokes about it as in it's like 'Jo'burg is going to be the only safe place left to live, so we're alright'. Again, some people take climate change more seriously than I do"*. CL6P3 felt that climate change is not as big a threat as people make it out to be, *"A lot of people, I guess, it is human nature to sort of blow the problem out of proportion. People really drive that death thing, what's going to happen to us".* CL6P4 felt disconnected, *"I'm not going to try and posture, I'm going to be very honest and say that I feel like climate change is a big thing happening there, and in my little world here I don't know if that can impact on it"*. CL6P5 added to this as a general problem where people see themselves as bystanders, *"So, I think, people sort of down-play their own role in climate change"*. CL6P6 noted her disconnect saying, *"I don't do anything personally, but live a good life".*

5.7.5.2 Consequence: Ignorance about climate change

A consequence of having no relationship with nature and climate change, when asked about thoughts about climate change, they express confusion and rationalisation (it is a natural process).

Ignorance about climate change dimensions

- ➔ Climate change as confusing
- ➔ Climate change as natural

Figure 102: Apathetic towards climate change category consequence dimensions

They described climate change as confusing. CL6P2 was unsure of what climate change is, *"Climate change – briefly explain what's climate change? What would I say about climate change? How can I put this one? The climate? The climate? I don't know how to put this one".* CL6P4 described climate change as confusing, *"Confusion and I say that because you read and hear so much and there are so many different points of view".* CL6P6 noted her confusion about climate change and associated it with astronomy, *"Don't the days and nights also get shorter?"* CL6P1 associated climate change with waste issues, *"Yes, we don't understand with plastic, and there's toxic waste, and these chemicals, and what the things are doing within nature"*. CL6P3 continued, *"I think, maybe, just being a bit more knowledgeable about what you're throwing away, the kind of products you buy, because I do think our garbage gets incinerated, isn't it?"* CL6P4 admitted that she did not know how to recycle, *"I think things, like recycling… But, you're going to ask me if I recycle, and I don't, and I will tell you why… It's because I don't know where to take the stuff. I don't know how to go about it".*

They rationalised climate change by saying that it is part of the natural earth process and therefore it is nobody's fault. CL6P1 said, *"Climate change, again, I haven't read all the research, I haven't done all the studies, and things, but I mean there's evidence that shows it's happened before"*. CL6P2 said climate change is a natural process, *"I think on my side, climate change has to do with the weather maybe changing. It's not the seasons, not the weather as such. Nature. I would say its nature".* CL6P5 agreed, *"You can't really say with the drought 'it's this guy's fault or it's that one's fault'. You sort of just*

have to acknowledge that these things happen". CL6P3 described it as a natural process using a story, *"I think nature has just had years and years and years of doing that. There's this one story about the island where there were two birds that ate the same food source, and one bird developed a different beak to be able to eat the other bird, so to create a system. Rather than fighting over the same food, it created a system of how it would work".* CL6P4 contemplated, *"I would ask the question 'are they the function of climate change? Or, is the climate a thing at the hand of God or is it something that's human impacted on?'".*

5.7.5.3 Process: Climate change benefits humanity

The process they use to deal with the phenomena of climate change is to position it as in part beneficial. Although some associate climate change with a dystopian world they feel that humans are designed to thrive in a world like that and therefore climate change ultimately benefits humanity. Furthermore, they perceive climate change as a consequence of materialism which means that people are becoming wealthier and that is a good thing.

Climate change benefits humanity dimensions

- ➔ Dystopian world benefits humans
- ➔ Consequence of modern world and making money

Figure 103: Apathetic towards climate change category process dimensions

They expressed the belief that a dystopian world would benefit humans. CL6P1 viewed climate change as nature's way of trying something new, *"That one dictates that people are destroying nature. Yes, we are consuming a lot. It's a person that's destroying the earth, right? I'm not saying it's bad for nature because like I say nature likes change. Nature likes experimenting".* CL6P1 said, *"…is it* (climate change) *really a bad thing? But, I don't think it's a bad thing".* CL6P2 believed it has benefits, *"I will be glad because I hear it* (a natural disaster) *normally when it happens, it crushes everything, so I will be clear from my debts".* CL6P3 described climate change as a state of living that humans are comfortable with, *"We're quite comfortable to live in the kind of distopian worlds that are created in things like the Chronicles of Riddick, you know those kind of movies that just really try and hammer into you the ideas of what the world could be if we don't change the way things are".* CL6P4 said it is beneficial, *"So I think although there'd be that sense of high tech, I would think that a lot of high tech would be put to good use as opposed to high tech to drive commercially, and hopefully high tech would be about providing food for people".*

They described climate change as a commercial venture rather than an environmental concern. CL6P1 said that is making people, who are exploiting fears, money, *"Look, I am concerned about it in the sense that big businesses are making a lot of money from going green, and people don't kind of see this aspect of climate change has created a new market, especially, for the people who are propagating climate change".* CL6P3 agreed that climate change is a capitalist opportunity for industry, *"I think it's a lot to do with people making money off something. As far as I understand, the easiest way to make money is*

through exploitation so it's either exploiting someone's needs or someone's fears to make money and offering security or solutions to problems which is what global warming presented".

5.8 Summary

This chapter presented the results of the Grounded Theory Analysis. It shows that the typologies each contain a range of nuanced elements that help explain their relationship to the biosphere. Identified categories and properties are shown to each play a role in the typological system as an expression of operationalised typological traits, micro and macro contexts, consequences, and processes typologies use to deal with phenomena.

A key objective of using Grounded Theory is its ability to build theory. However, for this study, the theory building process extends beyond the qualitative analysis to include the quantitative results and system dynamics. The theoretical expression of the results is described further in Chapter 6. The below table consists of a summary of the Grounded Theory insights presented.

Table 30: Summary of each typology based on Grounded Theory analysis

Typology 1: The Disconnected	Typology 2: The Observer	Typology 3: The Misunderstood
The analysis of Typology 1 suggests that some individuals who experience abandonment might react by focusing on the self and functioning in a survivalist mindset. This experience causes the typology to feel overwhelmed, isolated and like they have lost something. The process of placing the self at the centre, because of the need to survive emotionally, in a world from which they feel rejected they detach from nature and nature-related issues like climate change. They try to remedy their escape with religion as it provides them with a sense of belonging and a tool to deal with threatening issues	The analysis of Typology 2 suggests that people who function as observers in the world might be cognitively confused and physically distanced from nature. In order to deal with this confusion and distance they are likely to use knowledge and social norms for sense making, which creates tension and voluntary dissociation. Since they are observers of the world and of nature, their behaviour does not fit with what they know. They believe that knowledge is the answer to humanity's problems. This suggests that they are unclear of their relationship with nature and animals because they move between realities and between ways of knowing. This typology might be easily convinced through research and numbers but it is	The analysis of Typology 3 suggests that people who have experienced rupturing life experiences make them feel misunderstood and like outsiders. Their relationship with nature is painful because they share this victimhood with nature as they bear witness to the destruction of nature and fear that climate change will cause them psychological harm. They tend to view the world as a bad place where bad things happen and tend to connect better with non-human animals. They are victims, just like nature.

like climate change (it is God's will).	unlikely to influence their degree of pro-environmental behaviour.	
Typology 4: The Hero	**Typology 5: The Explorer**	**Typology 6: The Hedonist**
The analysis of Typology 4 suggests that people who want to leave a legacy will work to make a difference through helping and nurturing people. This legacy can only be gained through using nature as a stepping-stone to achieving this. Therefore, they feel a sense of connection to nature only in as much as nature can help them achieve hero status. Nature is important in terms of its value to humans and they tend to expect a lot from nature as they expect a lot from themselves. This shows an opportunity to link legacy building with environmentalism through a human-centric focus.	The analysis of Typology 5 suggests that healthy relationships with nature start at an early age and are linked to having healthy and caring relationships with both humans and non-humans. These relationships are universal meaning that they show an affinity for humans, even on a broader societal level, and for nature on a grander scale that includes general injustices against nature like climate change. Due to their universal outlook, they can see their role in the world in both its positive and negative aspects. This suggests that those who care deeply for nature can also care genuinely about the world and society. They are active citizens as they try to make a difference in the world.	The analysis of Typology 6 suggests that some people with positive life experiences can be socially dysfunctional. This typology has an extreme focus on themselves and they need to be the receivers of pleasure or reward. Their obsession with self-enhancement causes them to struggle connecting with the outside world and nature. However, this is not a problem for them as they are emotionally blunted. They struggle to feel, show, or read emotions. Their lack of feeling means that they do not care much about anything else except to create pleasure for themselves. In an attempt to function in the world, they try to create dialogue in different ways and they try to frame climate change as something positive. The unpleasantness of climate change and their lack of concern means that they are unlikely to engage with environmental issues unless it promotes self-pleasure and enhancement.

CHAPTER 6

INTEGRATIVE RESULTS & DISCUSSION

6.1 Introduction

Much has been written about environmental-related typologies (Awad, 2011; Balderjahn et al., 2018; Barnes & Toma, 2012; Bauer et al., 2009; Berghöfer et al., 2008; Bernstein & Szuster, 2018; Buijs et al., 2008; Cini et al., 2012; Defra, 2008; De Groot & Van den Born, 2003; Elgaaied, 2012; Fischer & Young, 2007; Flint et al., 2013; Gupta & Chopra, 2014; Hall et al., 2018; Hunka et al., 2009; Kellert, 1980; Leiserowitz et al., 2009; MacDonald et al., 2019; Osherenko, 1992; Pike et al., 2008; Poortinga & Darnton, 2016; Poškus & Žukauskienė, 2017; Teel & Manfredo, 2010; Thompson & Barton, 1994; Van den Born, 2008; Zheng & Yoshino, 2003), but their inherent complexity and theoretical value is poorly identified or articulated. This leads to a superficial exposition of individuals and the human nature-nexus that influences sustainability communication, climate change approaches, and green policy strategies. Encouraging individuals to live sustainable lifestyles is far more complex than previously thought and it needs to be understood within the context of individual, social, and cultural processes that are intertwined with individual issues such as health, finances, justice, and hedonism (Evans & Abrahamse, 2009). This study aimed to address gaps pertaining to location (the majority of human-nature nexus typologies emerged from developed countries) (Bauer et al., 2009; Berghöfer et al., 2008; Buijs et al., 2008; Hall et al., 2018; Kellert, 1980; Leiserowitz et al., 2009; MacDonald et al., 2019; Pike et al., 2008; Poortinga & Darnton, 2016; Thompson & Barton, 1994; Zheng & Yoshino, 2003), design (most studies build typologies using limited variables, simplistic methods, and typically exclude affect and personality) (Bernstein & Szuster, 2018; Buijs et al., 2008; Defra, 2008; MacDonald et al., 2019), interpretation (there is a lack of systems thinking in understanding typology processes) and contribution (there is a lack of typological theory as well as new theory in the field of ecopsychology). This chapter will show how the typologies identified in this research are richer and more theory-driven than shown in previous attempts.

The current lack of human-nature nexus research in developing countries has to be addressed since developing countries need to prepare for climate change impacts and adaptation as they are likely to be the least resilient (Mwiturubani & Van Wyk, 2010) with coastal town risks and impacts on tourism (Fitchett, Grant, & Hoogendoorn, 2016), environmental scarcity linking to the confluence of violence (Brown et al., 2007; Percival & Homer-Dixon, 1998), vulnerability of children to the impacts of climate change (UNICEF, 2011), and South Africa having overshot its biophysical threshold in July 2019 (Rockström et al., 2009; Volschenk, 2019). This research aimed to build typologies through using intrinsic, cognitive, affective, and behavioural variable sets for a broader and more nuanced understanding of how people are different when it comes to their relationship with the biosphere. Since existing typologies often use linear thinking to understand individuals, this study applied systems thinking (Meadows, 2008) to explore the dynamics of typologies as well as to build theory (Strauss & Corbin, 1998). The latter addresses the shortcoming that existing typologies fail to build on environmental theory and this study aimed to contribute new theory to the fields of ecopsychology (Roszak, 1992) and climate psychology (Andrews & Hoggett, 2019). Most typologies move from theory to data, rather than from data to theory (Parkhe, 1993).

This chapter will deal with the systems thinking and theory building objectives by integrating high-level findings from both the quantitative and qualitative phases. Causality and directionality within the systems are interpretively grounded as neither the survey, nor the interviews permit causal direction conclusively. The second part of this chapter will explore the emergence of types of systems and what that means for advocacy, communication strategy, policy, technology, ecopsychology, and deep adaptation endeavors.

6.2 Intersection between theory building and systems thinking

For a typology to be a theory, properties need to emerge, relationships between properties need to be explained (Martin, 1986), and these relationships need to be falsifiable (Doty & Glick, 1994). These properties, that form categories, need to be well developed and related (Charmaz, 2006; Finch, 2008; Strauss & Corbin, 1998; Suddaby, 2006) to show their systems processes and then build theory.

The aim of building theory was to elevate the studied phenomena above description (Glaser, 2002) towards an interpretative framework that highlights indeterminacy, an imaginative exploration of the studied phenomenon and the emergence of multiple realities (Charmaz, 2006) within a designated empirical area (Wicker, 1989). The theory will be described as a narrative that functions as an integration of the properties showing relationships as a coherent system (Buford, 2009; Glaser & Strauss, 2006; Martin, 1986). The narrative demonstrates researcher presence in the phenomenon under investigation, is linked to theoretical data points (quantitative and qualitative), and is woven together moving between showing and telling (Locke, 2001).

Building theory naturally intersects with systems thinking because systems demonstrate how problems are organised in the world relating to the phenomena, whereas Grounded Theory discovers the organisation of the problem (Gibson & Robinson, 2005). In order to make the typological world understandable, Grounded Theory fractures the world and Systems Theory brings it back together as an emerging interaction of properties explaining the phenomena.

> *"This is why systems thinking is so important for public policy decision-making. Understanding a system helps decode complexity, allowing possible consequences of decisions to be simulated and examined. This can guide how political narratives are framed and policy proposals explained, optimizing public acceptance of unpopular decisions whose benefit to mental health may not initially seem obvious (such as closing coal mines, curbing private car usage, or taxing red meat). Systems thinking also helps with the important task of identifying a priori where interventions may fail, costs exceed benefits, or perverse outcomes eventuate. An important benefit of systems thinking for climate change and mental health is that it can help align the needs of this emerging field with existing policy, research and agendas."* (Berry, Waite, Dear, Capon, & Murray, 2018, p. 284)

6.3 Typological systems and theory

The Grounded Theory analysis (Babchuck, 2011; Charmaz, 2006; Glaser & Strauss, 2006; Strauss & Corbin, 1998) yielded categories and properties with associated dimensions that explain the

phenomenon: typology relationship with the biosphere. Each of these properties play a role in the typology, as a micro- or macro-condition, a consequence, or an action-interaction that are processes that inform flows within the system. Although each of these properties has relationships with each other, since they emerge from the same typology, the extent of their relationships in the typological system is not always apparent. To this end, MDS was used to ascertain the strength of the relationships between properties that form the typological system. MDS is a technique that assists in understanding the proximity of properties to each other to enhance the understanding of the system dynamics related to the phenomenon that, in turn, inspires theory finalisation (Hout et al., 2016). MDS data were based on the extraction of the co-occurrence qualitative data available in ATLAS.ti. This is an automated output based on similarity and dissimilarity data in the program. Based on the results from the Scree plot and Shepard plot, two-dimensional maps were generated. These maps were then positioned in a joint display as part of a multivariate approach that allows for greater abstraction and capacity for depth (Walsh, 2015) when building systems and theory.

6.3.1 Disconnected typology system and theory

The main inputs for the building of the *Disconnected* typological system and theory is Table 28 – Column A (summary of key quantitative results) in the quantitative results chapter and Figure 26 (the theoretical structure for the typology) in the qualitative results chapter. Figure 104 shows the *Disconnected* typology system and the emergence of four groups (A, B, C, D) that link to the quantitative results. These groups consist of the properties that cluster together, based on the MDS (stress = 0.115), in a logical and coherent manner.

Key quantitative insights	Links	Relationship between qualitative constructs
1. They have a poor relationship with nature and animals	B C	
2. They are unwilling to take responsibility for issues related to nature	B C D	
3. Where environmental issues intersect with their well-being, some claimed concern or behaviour emerges	B C	
4. They value aspects that increase their ability to survive and enable them to avoid threats	A B	
5. They are disconnected from the outside world	A B C D	
6. They operate with the head rather than heart, to protect themselves	A B	

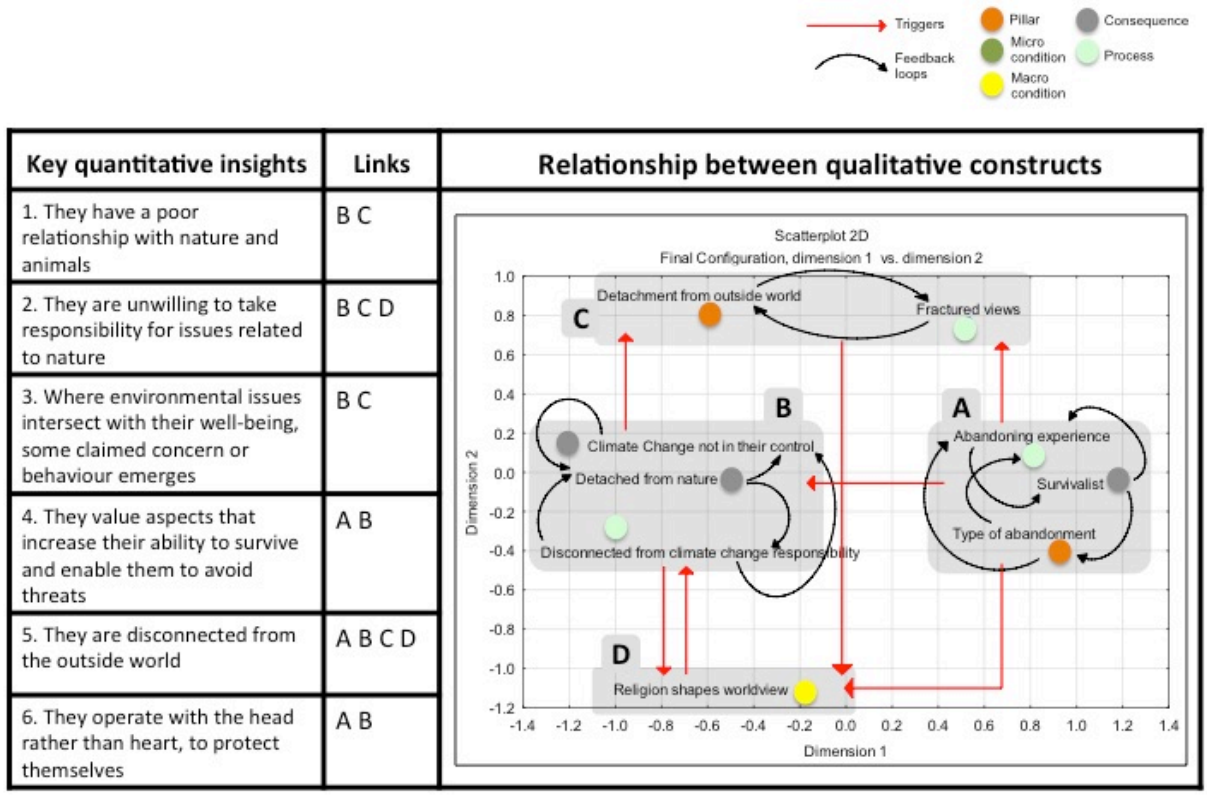


Figure 104: A joint display showing the Disconnected system

6.3.1.1 Dynamics Group A

The MDS map shows ‘abandoning experience’, ‘survivalist’, and ‘type of abandonment’ grouping together. ‘Type of abandonment’ functions as a pillar that means that it forms an essential element for understanding the system dynamics related to the phenomenon. Therefore, if we place the ‘type of abandonment’ as a trigger, it makes sense that the consequence of this ‘abandoning experience’ is operating in a ‘survivalist’ mode. When operating in a ‘survivalist’ mode the processes used by the typology are the ‘abandoning experience’ that includes feelings of burden, isolation, and feeling lost or as if one has experienced loss. The processes described in group A possibly make the system feel more alone, creating positive feedback loops that increase the chances of the system feeling even more isolated and abandoned. The consequence of operating in a survivalist mode places the system at risk for interpreting situations as potentially abandoning and therefore reinforcing that pillar as a positive feedback loop. This grouping is underscored by quantitative insights 4 (value aspects that increase their ability to survive and enable them to avoid threats), 5 (disconnected from the outside world), and 6 (operate with the head rather than the heart). These dynamics trigger (shown in red) the other processes we see in the system showed as Groups B, C, and D.

6.3.1.2 Dynamics Group B

The MDS map shows ‘climate change not in their control’, ‘detached from nature’, and ‘disconnected from climate change responsibility’ grouping together. The system operates in a survivalist mindset due to their abandoning experiences and emotional responses to those experiences (Group A). The survivalist mindset means that the system is forced to place itself at the center, making everything else profane or disconnecting itself. It is this process that is represented in Group B. These processes trigger a detachment from nature, which means they are disconnected from climate change and that they also feel it is not within their control. Disconnecting from climate change and feeling that it is not in their control triggers a positive feedback loop of detaching further from nature because they feel like they are too far removed from it all. This removal is the system’s way of protecting itself against further abandonment. Their apathy, indicated in the detailed quantitative results (they scored the highest on apathy; $\bar{x} = 3.20$), also functions as an accelerator of detachment meaning it is easier to detach from something you do not care about. Only when nature-related issues threaten their own direct survival are they likely to take notice. This grouping is underscored by quantitative insights 1 (poor relationship with nature and animals), 2 (unwilling to take responsibility for issues related to nature), 3 (where environmental issues intersect with their well-being, some claimed concern or behavior emerges), 5 (disconnected from the outside world), and 6 (operate with the head rather than the heart).

6.3.1.3 Dynamics Group C

The MDS map shows ‘detachment form outside world’ and ‘fractured views’ grouping together. Group A and B trigger Group C. Group A, as discussed, is the primary system trigger that triggers Group B. A and B together impact group C since the typology is survivalist because of their experiences and associated negative emotions, in conjunction with their detachment from nature and climate change they feel detached from the outside world because they feel like they need to focus on self-preservation and importance. However, Group C shows an element of the system that is trying to self-regulate. There

is tension between the operation of being detached from the outside world and the inherent human need to belong. This leads to fractured views where the typology expresses mixed ideas about the self and the outside world (i.e. I have to detach to protect myself, but I have a desire to belong and not be abandoned by the world). This fragmentation and process of trying to self regulate (process) triggers Group D. This grouping is underscored by quantitative insights 1 (a poor relationship with nature and animals), 2 (unwilling to take responsibility for issues related to nature), 3 (where environmental issues intersect with their well-being, some claimed concern or behaviour emerges), and 5 (disconnected from the outside world).

6.3.1.4 Dynamics of Group D

'Religion shapes worldview' sits on its own in the MDS space. Religion is triggered by groups A, B, and C and links to the quantitative insights 2 (unwilling to take responsibility for issues related to nature), 4 (value aspects that increase their ability to survive and enable them to avoid threats) and 5 (disconnected from the outside world). Religion, as a macro condition, provides some sense of belonging in being able to speak to God, but they feel at times that issues like climate change are part of God's will, which in turn allows them to disconnect. This permissible disconnect creates a trigger for further reinforcement of Group B.

6.3.1.5 Disconnected typology theoretical statement and comparison

The theoretical statement is a narrative or discursive attempt at showing the theoretical connections between the properties that are shown in the joint display (figure 104). This aims to be a theoretical narrative about the typology that links the main quantitative and qualitative categories/properties (in italics) with each other.

People who are *Disconnected* have experienced some *type of abandonment* in their lives. *They are disconnected from the outside world* as they *operate with their head rather than their heart* as a *survivalist*. This experience of survival is expressed financially and emotionally. Due to this survivalist worldview they value aspects that *increase their ability to survive and help them to avoid threats*. Their personality tends to shape and reinforce this way of living in the world, as they prefer to not feel much and avoid dealing with their inner experiences. As such, the *abandoning experience* leaves them feeling alone and burdened in the world. These feelings encourage them to seek a higher power to help them make sense of the world and their experiences and also to provide a sense of belonging through being accepted by a higher power by which one cannot be abandoned or rejected. *Religion* ends up *shaping their worldview,* as it is where they experience safety and where they no longer feel abandoned. As part of their strategy to survive and avoid threats in the world, they *detach from the outside world,* and in turn, this means also being *detached from nature*. Being detached from nature means having a *poor relationship with nature and animals*. Their detachment from nature causes them to generally function in a state of survival, being *unwilling to take responsibility for issues related to nature,* and they feel that *climate change is not in their control* and therefore they *disconnect from climate change responsibility*. Should *environmental issues intersect their ability to survive, they claim concern*. However, being disconnected but having an inherent need to belong means that their views of the world and themselves

are often *fractured* as they struggle to reconcile being abandoned, needing to protect themselves, and having a desire to be loved and to belong.

The *Disconnected* typology shows relatedness with the *Disengaged* typology (Leiserowitz et al., 2009) on aspects of lack of knowledge of climate change, not giving environmental issues much attention, not believing that individual behavioural adjustments could make a difference, and engaging in traditional religious beliefs. They also show similarities with the *Murky middles* (Pike et al., 2008) on the experience of being socially isolated and not showing an interest to help others in need. The *Disconnected* typology shows similarities to the *Stalled Starters* (Defra, 2008) in that they have other serious life issues they feel they need to focus on before they can consider broader issues such as those related to the biosphere. A “disconnect” means nature is just something to use which is similar to the distanced relationship of the *Nature sympathisers* (Bauer et al., 2009). Berghöfer et al. (2008) identified the typology of *No direct relationship with nature* that corresponds to the *Disconnected* typology on aspects of isolation from the biosphere as well as apathy which is similar to the *Apathetic* (Elgaaied, 2012) and *Distanced* typology (Teel & Manfredo, 2010).

Although there are some points of comparison with existing typologies the latter are superficial and lack exploratory value. They show no emergence of new concepts such as how experiences of abandonment lead to a survivalist mindset causing the typology to focus on the self. This focus on the self leads to the *Disconnected* system, perhaps subconsciously, avoiding any information that is not relevant to their emotional, physical or financial survival. These processes describe a more complete typology when it comes to not giving environmental issues much attention or having knowledge about climate change compared to the *Disengaged* typology (Leiserowitz et al., 2009) that lacks depth. The *Disconnected* system further provides a better understanding of why these types might feel that individual behavioural changes will not make a difference. This belief in lack of personal impact is underscored by their abandoning experiences in which they felt they had no control, and because of this, combined with their survivalist mindset, they feel like climate change is not under their control. Although both the *Disconnected* typology and the *Disengaged* typology (Leiserowitz et al., 2009) are similar in engaging in traditional beliefs, the *Disengaged* typology (Leiserowitz et al., 2009) is not fully formed as it fails to provide insight into the function of traditional beliefs in the typological system. The *Disconnected* system is more complete than this, and perhaps even different, in that it expands on how traditional beliefs, such as religion, provide the system with a sense of belonging but at the same time reinforces their disconnect and isolation from the outside world, nature, and climate change. These disconnecting processes describe a typology that is more fully developed than the *Murky middles* (Pike et al., 2008), *No direct relationship with nature* (Berghöfer et al., 2008), *Apathetic* (Elgaaied, 2012), *Distanced* (Teel & Manfredo, 2010), and *Nature sympathisers* (Bauer et al., 2009) because it shows how isolation and apathy is psychologically formed and then leads to no interest in helping others or nature, which in turn causes reinforcing feedback loops, making the system feel more disconnected. The *Disconnected* system further shows how isolation is generalised as they are detached not only from others, but also from nature and climate change, and how this detachment is reinforced by their need to survive in a world that has abandoned them. This understanding shows a deeper exposition of their reasons for not

considering broader issues like climate change, compared to the superficial and behaviourally focussed *Stalled Starters* (Defra, 2008) typology.

6.3.2 Observer typology system and theory

The main inputs for the building of the *Observer* typological system and theory are shown in Table 28 – Column B (summary of key quantitative results) in the quantitative results chapter and Figure 36 (the theoretical structure for the typology) in the qualitative results chapter. Figure 105 shows the *Observer* typology system and the emergence of five groups (A, B, C, D, E) that link to the quantitative results. These groups consist of the properties that cluster together, based on the MDS (stress = 0.178), in a logical and coherent manner.



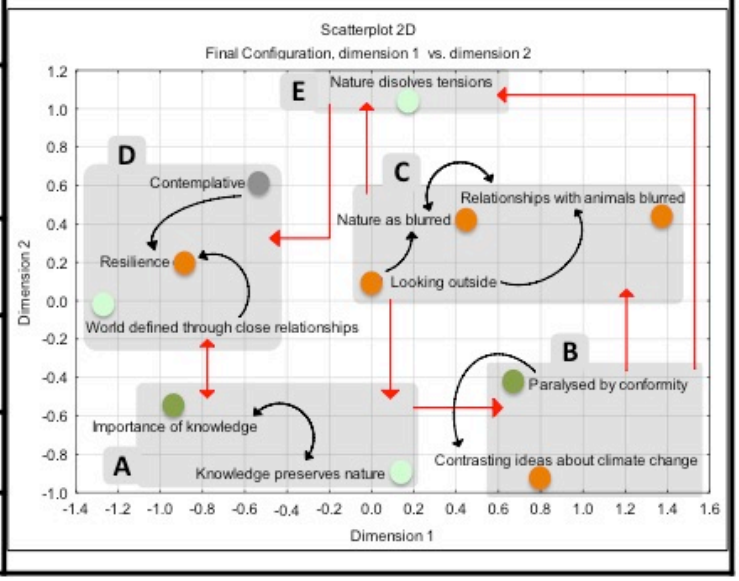
Key quantitative insights	Links	Relationship between qualitative constructs
1. They are uncommitted when it comes to concerns about nature	A B C	
2. They observe the urgency related to environmental issues which might cause tension with their low-moderate affective relationship	A C	
3. They express some concern about issues that will impact humanity	B C D	
4. They behave pro-environmentally in areas which have social value	B C	
5. They are followers that seek social approval	B C D	
6. They observe in order to regulate their emotions	A B C D E	

Figure 105: A joint display showing the Observer system

6.3.2.1 Dynamics Group A

The MDS map shows the 'importance of knowledge' and 'knowledge preserving nature' as grouping together. Valuing knowledge provides an uncommitted and observational way to interact with the world, it creates a cognitive connection between the individual and nature. Therefore, they feel that knowledge will preserve nature, rather than their individual behaviour. This dynamic relates to quantitative insights 1 (uncommitted when it comes to concerns about nature), 2 (observe the urgency related to environmental issues), and 6 (they feel, yet observe). These dynamics trigger (shown in red) the other processes we see in the system showed as Group B and D. Due to the value they place on knowledge they demonstrate confusion about climate change (different messaging exposure and inability to commit) and they feel paralysed by conformity because there are different socially acceptable ways to rationalise climate change (Group B). Group A has a reinforcing feedback loop with group D in that

knowledge builds resilience, encourages contemplation and helps them to conform to groups that are important to them. At the same time these conforming processes increase the importance of knowledge that impacts their relationship with nature. Group A is impacted by Group C in that their blurred relationship with nature and animals and observer worldview means that knowledge is something that they feel might resolve these tensions.

6.3.2.2 Dynamics Group B

The MDS map shows that Group B includes 'paralysed by conformity' and 'contrasting ideas about climate change'. They are in close proximity because the need to conform creates tension with climate change ideas. They are required to take into consideration the socially acceptable ways of seeing climate change and often this is through constructed silence. However, their interest in knowledge means that they often receive other ideas about climate change. These dynamics relate to quantitative insights, 1 (uncommitted when it comes to concerns about nature), 2 (observe the urgency related to environmental issues which might cause tension with their low-moderate affective relationship), and 4 (behave pro-environmentally in areas which have social value), 5 (followers that seek social approval), and 6 (observe in order to regulate their emotions). These processes trigger Group C and Group E. They trigger Group C because this conformist-induced paralysis and contrasting ideas about climate change create further rifts in their relationship with nature and animals, reinforcing their view of being an observer of the world, rather than a participant. Group B impacts Group E as this typology often uses nature (at some distance, looking rather than experiencing) to dissolve the tensions they experience from having to conform and deal with contrasting views about climate change.

6.3.2.3 Dynamics Group C

The MDS map shows 'looking outside', 'nature as blurred', and the 'relationship with animals blurred' as grouping together. Since they operate in the world as somebody looking through a window at what is happening to nature and animals their vision of nature is often blurred. Their blurred relationship with nature, underscored by conformity, means that their relationship with animals is also blurred. These processes relate to quantitative insights 1 (uncommitted when it comes to concerns about nature), 2 (observe the urgency related to environmental issues which might cause tension with their low-moderate affective relationship), and 3 (express some concern about issues that will impact humanity), and 4 (behave pro-environmentally in areas which have social value), 5 (followers that seek social approval), and 6 (observe in order to regulate their emotions). Group C is impacted by Group B and in turn impacts Group A. It triggers a need to balance tension experiences and therefore it encourages a desire to spend time in nature in order to dissolve tensions, which is depicted by Group E. Although they describe these intentions, they rarely spend time in nature and act on these intentions.

6.3.2.4 Dynamics of Group D

The MDS map shows that 'contemplative', 'resilience', and 'a world defined through close relationships' are grouped together. This suggests that conforming, contemplating, and close relationships build resilience. These processes relate to quantitative insights, 3 (express some concern about issues that

will impact humanity), 5 (followers that seek social approval), and 6 (observe in order to regulate their emotions). Group D is impacted by Group A in that knowledge (or rather information) creates distance from issues and distance reduces accountability, relational affect, and impact that issues have on the self (i.e. to watch a documentary about climate change increases knowledge but might not increase personal accountability or trigger an affective response). Group E impacts Group D in that dissolving tensions increases the ability of the typology to be resilient in responding to personal challenges (that are both in and not in their control) and to express generalized contemplation (analytical thinking) and also specific contemplation about the role of religion and spirituality.

6.3.2.5 Dynamics of Group E

The MDS map shows that 'nature dissolving tensions' is a dimension on its own. This is possibly because it is something that participants shared as an option to dissolve the tensions they experience, but they seldom carry out these behaviours directly, instead opting to watch nature-based screen savers or driving next to a nature space as this observant approach to nature is more comfortable for them. It has the potential to positively impact Group D as discussed above but also to be impacted by Group B and Group C that are processes that cause tensions.

6.3.2.6 Observer typology theoretical statement and comparison

The theoretical statement is based on the joint display shown in figure 105.

People who are *Observers* live their lives as if they are *looking outside* at the world. This observational and information seeking approach, combined with their personality, *helps them regulate their emotions* and develop *resilience* as it forms a buffer between them and what is happening in the world. They place high *importance on knowledge* that enables them to approach life experiences and observations with a *contemplative* mindset. As *followers*, their *world* is *defined through conforming* to those *they have close relationships* with. This need to conform means that they show *environmental concern about issues that will impact humanity* (specifically those they love) and they are *likely to behave pro-environmentally in areas that have* high *social value*. They are looking through a window at the world, therefore their *relationship with nature and animals is blurred*. This blurred relationship means they are *uncommitted when it comes to concerns about nature*. Seeking knowledge reinforces the buffer that stands between them and the world outside, and as such, they believe that *knowledge will preserve nature* rather than individual behaviour or action. This movement between observing the outside world, and experiencing their own world, means that they sometimes experience tensions. They engage with nature, from a distance (through a screensaver, or looking at nature through a car window) to help *dissolve* these *tensions*. Tensions are amplified by expectations from society and what they observe (especially when the two are juxtaposed). This causes them to feel *paralysed by conformity* moving them back into being an observer. Their observer status means that they have *contrasting ideas about climate change* in part because they *observe the urgency related to environmental issues, but their affect is low*.

The *Observer* typology shows some similarity to the *Community focused* typology (Poortinga & Darnton, 2016) that is conservative; prioritises community engagement and values social capital more than

environmental issues. Aspects of the *Intellectual relationship* typology (Berghöfer et al., 2008) also relate to the *Observer* in that their relationship with nature is based on knowledge and the educational value of nature. The *Humans as users of nature* typology (Fischer & Young, 2007) values nature for its recreational value and is similar to the dissolving tensions aspect of the *Observer*. *Cautious participants* (Defra, 2008) and the *Post-modern tourist* typology (Cini et al., 2012) relate in their need to conform and receive social acknowledgement. As a consequence of this behaviour, change is motivated only once mainstream up-take has taken place on environmental issues. This relates to aspects of the *Ambiguous* typology (Awad, 2011) in that although they have ecological knowledge, they are behaviourally disconnected from what they know. This typology also relates to the *Socially conscious financial simplifiers* who show regard for social and economic consciousness and appreciate conformity (Balderjahn et al., 2018).

Although there are some points of similarity with existing typologies the latter fail to describe deeper processes that are at work and how those impact the human-nature nexus. The *Community focused* typology (Poortinga & Darnton, 2016) and *Ambiguous* typology (Awad, 2011) lack a deeper explanation of the role that social capital plays in how this type navigates the world and what that means for how they relate and behave towards nature. The *Observer* typology is more complete in that it shows that conformity potentially causes an experience of environmental paralysis in situations where there are tensions between what is the norm, what they know, and their affect towards nature. Furthermore, the *Observer* system extends the *Intellectual relationship* typology (Berghöfer et al., 2008) describing knowledge used as a crutch, with the unintended consequence of reinforcing tensions caused by this uncertainty-based messaging about climate change or other environmental issues. It is also different in that the *Observer* system demonstrates how knowledge is linked to conformity and their relationship with nature becomes blurred. The *Humans as users of nature* typology (Fischer & Young, 2007) fails to describe the underlying processes that allow this mindset to emerge. For the *Observer* system they see nature as something to be used to release the tensions they experience from being an observer in the world, and that in turn reinforces their ability to be resilient through contemplation and valuing their close relationships. Furthermore, the concept or typology of Humans *as users of nature* typology (Fischer & Young, 2007) is not unique and might manifest in a nuanced manner in other typologies such as the *Hero* or the *Hedonist* types as it is more a description of an ideology than a typology. The *Cautious participants* (Defra, 2008) and *Agreeable and closed* (Poškus & Žukauskienė, 2017) typologies are superficial as they fail to describe what conformity and acknowledgement mean for the nature-nexus and the broader operations of the *Observer* system. The *Observer* system shows that social capital and being agreeable/conforming are about belonging and being acknowledged. These nuances are lacking in existing typologies such as the *Cautious participants* (Defra, 2008) and *Post-modern tourist* typology (Cini et al., 2012). The *Observer* typology is different to the *Socially conscious financial simplifiers* (Balderjahn et al., 2018) as it provides a meaningful understanding of their relationship with nature rather than just a functional understanding of their behaviour.

6.3.3 Misunderstood typology system and theory

The main inputs for the building of the *Misunderstood* typological system and theory is Table 28 – Column C (summary of key quantitative results) and Figure 106 (the theoretical structure for the typology) in the qualitative results chapter. Figure 48 shows the *Misunderstood* typology system and the emergence of five groups (A, B, C, D, E) that link to the quantitative results. These groups consist of the properties that cluster together, based on the MDS (stress = 0.195), in a logical and coherent manner.



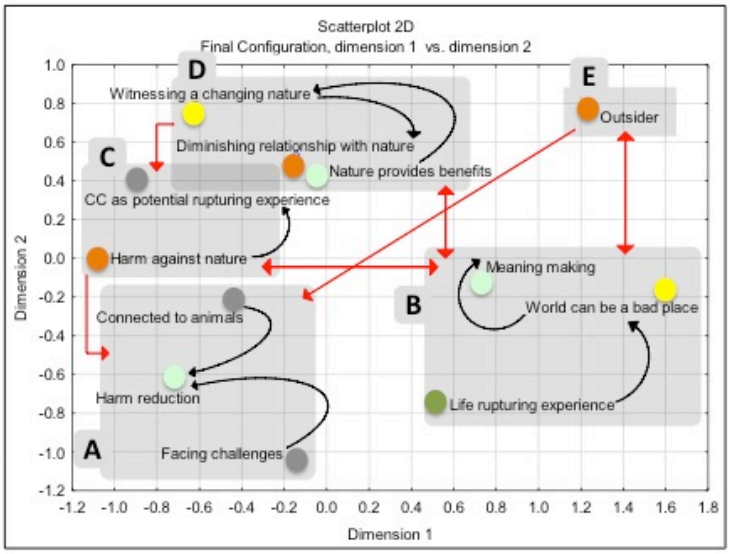
Key quantitative insights	Links	Relationship between qualitative constructs
1. They feel affect towards nature	A C D	
2. They perceive environmental concerns as potentially rupturing	B C	
3. Their environmental behaviour does not match their affect towards nature	A B C D	
4. They do not value conformity, tradition, benevolence or security	E	
5. They are highly introverted	E	

Figure 106: A joint display showing the Misunderstood system

6.3.3.1 Dynamics Group A

The MDS map shows 'facing challenges', 'harm reduction', and 'connected to animals' grouping together. Their experience of facing challenges means that they connect more to animals than people. The process they use to deal with their experience of feeling connected to animals and facing their own challenges is harm reduction methods. This dynamic relates to quantitative insight 1 (feel affect towards nature) and 3 (environmental behaviour does not match their affect towards nature). These dynamics are triggered (shown in red) by other processes in the system namely Group C and E. Group C impacts Group A in that it is a reinforcing loop because they witness harm against nature and anticipate another potential rupturing experience through climate change. Group E reinforces Group A mostly because they are outsiders and misunderstood by others in society that they more easily connect to animals, find it easier to manage their own behaviour through harm reduction, and the process of facing personal challenges shows that they are less connected to other humans. They have a shared victimhood with nature and animals.

6.3.3.2 Dynamics Group B

The MDS map shows that 'meaning making', 'world can be a bad place', and 'life rupturing experience' group together. Their negative experiences reinforce their experience that the world is a bad place for everybody. However, in an attempt by the system to seek homeostasis they try and make meaning out of their suffering (Frankl, 1984). These dynamics relate to quantitative insights, 2 (perceive environmental concerns as potentially rupturing) and 3 (environmental behaviour does not match their affect towards nature). These system processes have a reinforcing loop with Group C, D, and E. Since Group C links to potential and current rupturing experiences related to nature, there is mutual reinforcement with the experience of the world as a bad place, the experience of rupturing, and trying to understand them. This sensitizes the system to witness and anticipate more harm. There is also a reinforcing loop with Group D as they bear witness to harmful changes in nature that impact their own positive relationship with nature. The mutual reinforcing loop with Group E emerges as their experience of the world as a bad place makes them feel more like an outsider.

6.3.3.3 Dynamics Group C

The MDS map shows 'harm against nature' and 'climate change as potential rupturing experience' grouping together. These group together because they are witnesses to the destruction of nature and they fear climate change will be another rupturing or traumatic experience that they will need to deal with. These dynamics relate to quantitative insights 1 (feel affect towards nature), 2 (perceive environmental concerns as potentially rupturing), and 3 (environmental behaviour does not match their affect towards nature). Group C impacts Group A and is impacted by Group D and Group B. Group D and Group B reinforce the processes of Group C in that they are witnesses to the victimisation of nature and they are experiencing a sense of loss that reinforces their experience of a bad world.

6.3.3.4 Dynamics of Group D

The MDS map shows that 'witnessing a changing nature', 'diminishing relationship with nature', and 'nature provides benefits' group together. This grouping suggests that the typology is experiencing loss because nature is changing; their relationship is weakening with nature that actually provides benefits to the operation of the system. These dynamics relate to quantitative insights 1 (feel affect towards nature) and 3 (environmental behaviour does not match their affect towards nature). As discussed, Group D impacts Group C and is impacted by Group B. It is clear that this system is functioning on positive feedback loops reinforcing bad experiences in the world.

6.3.3.5 Dynamics of Group E

The MDS map shows that the property 'outsider' sits on its own. This is possibly due to it being a strong systemic pillar and directly or indirectly connected to all other Group functioning. It relates to quantitative insights 4 (do not value conformity, tradition, benevolence, or security) and 5 (highly introverted) and creates reinforcing loops with Group B and Group A. All loops in the system reinforce their experience as being misunderstood or being an outsider because victims can see other victims, but feel like nobody else is bearing witness to what is happening.

6.3.3.6 Misunderstood typology theoretical statement and comparison

The theoretical statement is based on the joint display shown in figure 106.

People who are *Misunderstood* describe traits of feeling like an outsider. Their *high introversion* means that they naturally orientate towards the inner and subjective world and do not require constant contact with the outside world. They are unable to conform to the status quo but also don't necessarily want to as they *do not value conformity, tradition, benevolence, or security*. They express having had life *rupturing experiences* (e.g. father committing suicide in front of them, coming out as LGBTI). These experiences and their belief that they are outsiders or misunderstood make them feel like the *world can be a bad place*. They spontaneously consider *environmental concerns* and the impacts of climate change and describe *climate change as a potential rupturing experience* in the future. Their life experiences and shared victimhood with nature means that they see humans as bad because of the *harm being caused to nature*. They *feel affect towards nature* and automatically describe feeling more *connected to animals* than to people. In order to deal with all these negative experiences and associated emotions, they try to *make meaning* through searching for control or trying to find a resolution for their challenges. Part of finding a resolution is through *harm reduction* activities that they apply to their own lives. However, the harm reduction activities, when it comes to *environmental behaviour, do not* [always] *match their affect towards nature*. Additionally, they perceive *nature as beneficial* but see nature as a victim of humanity's greed and they are *witnessing a changing nature*. They see nature as being augmented and this change means that their *relationship with nature is diminishing*. They feel like they are losing nature.

The *Misunderstood* typology shows some similarity to the *Cruel worlders* (Pike et al., 2008) who have a negative outlook on life as they do not believe the future will be improved and they express feeling socially isolated, experience the world as confusing and are sceptical of other humans. Interestingly the *Changing relationship* typology (Berghöfer et al., 2008) shows inverse experiences to the *Misunderstood* typology where the *Changing relationship* type expresses finding a closer and more connected relationship with nature whereas the *Misunderstood* feels that their relationship with nature is being lost. *Humans as potential enemies of nature* typology (Fischer & Young, 2007) share the belief that humans are enemies of nature with the *Misunderstood*. The *Sideline supporters* typology (Defra, 2008) also expresses guilt for harming the biosphere and the *Moralistic* (Kellert, 1980) typology are similarly concerned about exploitation and cruelty towards animals. The *Activist greens* (Bernstein & Szuster, 2018) also believe that modern lifestyles are bad for nature, which is somewhat similar to the *Misunderstood* typology who believes that humans are bad. There is also some correspondence to the *Negative* type who is highly neurotic and less extraverted, agreeable, conscientious, open, and emotionally stable (Poškus & Žukauskienė, 2017).

Although there are some points of comparison with existing typologies the latter are problematic because they lack sensitivity towards the individual contexts that give rise to the way in which these typologies relate to nature. Existing typologies also fail to explain how a connected relationship with nature can be a painful experience for some. The *Misunderstood* system links rupturing experiences in

life, the way these types of individuals see the world, and subsequently how they relate to nature. It explains that there are feedback loops between feeling like an outsider, bad experiences, and ultimately experiencing a shared victimhood with nature. This understanding is different to the *Cruel worlders* (Pike et al., 2008) and *Activist Greens* (Bernstein & Szuster, 2018) that both fail to explain why they have a negative outlook, are socially isolated, feel negative about the future, and consequently how that impacts on their relationship with nature. Similarly the *Humans as potential enemies of nature* typology (Fischer & Young, 2007) fails to provide insights into the underlying processes and experiences that manifest this belief. The *Misunderstood* system explains how a combination of intrinsic traits (such as introversion) combined with life experiences and perceptions can shape their relationship with nature and increase their connection to animals. It also explains the context in which harm reduction behaviours manifest, which expands the understanding of guilt as a motivator, as identified in the *Sideline supporters* typology (Defra, 2008) and *Moralistic* typology (Kellert, 1980). Lastly, the *Negative* type (Poškus & Žukauskienė, 2017) fails to link insights of individual traits to life contexts and the human-nature nexus.

6.3.4 Hero typology system and theory

The main inputs for the building of the *Hero* typological system and theory is Table 28 – Column D (summary of key quantitative results) and Figure 61 (the theoretical structure for the typology) in the qualitative results chapter. Figure 107 shows the *Hero* typology system and the emergence of five groups (A, B, C, D, and E) that link to the quantitative results. These groups consist of the properties that cluster together, based on the MDS (stress = 0.167), in a logical and coherent manner.



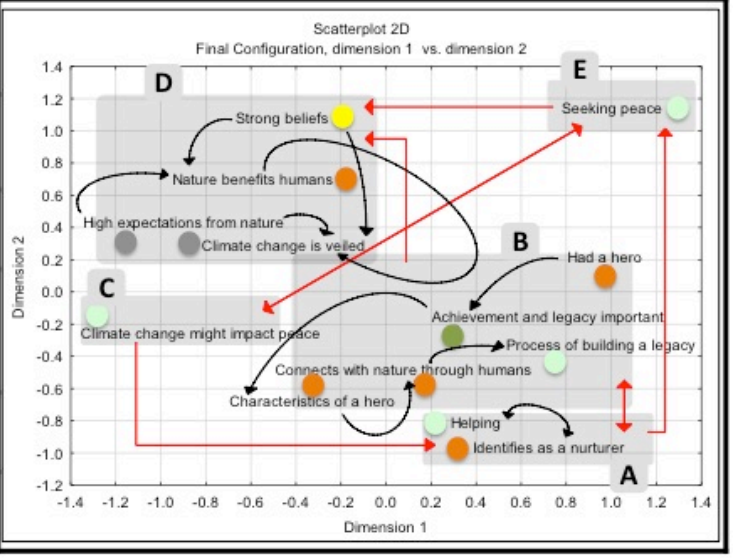
Key quantitative insights	Links	Relationship between qualitative constructs
1. Their emotional connection to nature is mediated through a dominant social paradigm	B C D E	
2. They are concerned about human-centric environmental problems	B C D	
3. Human ingenuity will solve environmental problems	A D E	
4. They behave pro-environmentally in areas that have financial and nurturing benefits	A E	
5. They value conformity, tradition, achievement	D	
6. They have a judging personality	D	

Figure 107: A joint display showing the Hero system

6.3.4.1 Dynamics Group A

The MDS map shows 'helping' and 'identifies as a nurturer' grouping together. These two elements reinforce each other as the *Hero* typology identifies as a nurturer that wants to help and through helping, they will build a nurturing identity. This dynamic relates to quantitative insights 3 (human ingenuity will solve environmental problems) and 4 (behave pro-environmentally in areas that have financial and nurturing benefits). These dynamics trigger (shown in red) the other processes we see in the system shown as Group E and Group B. They try to help through being a nurturer, which triggers a need to seek peace in different ways (Group E). Furthermore, there is a reinforcing feedback loop between Group A and Group B. They reinforce each other because being a nurturer and helping leads to them being a hero, through connecting with people and then leaving a legacy. Being a hero, in turn, is about helping through nurturing. Group C impacts Group A, because they are noticing climate change, they feel it will impact their ability to help and nurture because they lack knowledge about climate change which is intangible and makes it difficult to address from a nurturer perspective. This typology thrives on acknowledgement for their efforts and climate change does not provide the same acknowledgement or reward as, for example, building houses for poor people.

6.3.4.2 Dynamics Group B

The MDS map shows that 'characteristics of a hero', 'connects with nature through humans', 'process of building a legacy', 'achievement and legacy important', and 'had a hero' grouping together. This shows that they are people-centric and that nature is interpreted through this humanistic lens. All the elements in this grouping reinforce and impact each other. These dynamics relate to quantitative insights 1 (emotional connection to nature is mediated through a dominant social paradigm) and 2 (concerned about human-centric environmental problems). As discussed, there is a reinforcing feedback loop between Group A and Group B. Group B reinforces Group D as this is what helps them build a legacy and to be a hero (i.e. to be anthropocentric, to elevate themselves as apart from the environmental problem, to have unwavering beliefs, and to see humans as more impressive than nature).

6.3.4.3 Dynamics Group C

The MDS map shows that 'climate change impacts peace' sits alone between people-centric Group B and the way in which they frame being a hero as expressed in Group D. Interestingly it is sitting further apart from Group E, suggesting that this typology does not overtly link their process of seeking peace with the fact that climate change might impact peace. It also substantiates the emergence of climate change as not being a large part of how they plan on creating peace or building a legacy. Climate change operates at the periphery. There is a self-reinforcing link, but it is a weak one. Group C impacts Group A, as discussed. These dynamics relate to quantitative insights, 1 (emotional connection to nature mediated through a dominant social paradigm) and 2 (concerned about human-centric environmental problems).

6.3.4.4 Dynamics of Group D

The MDS map shows that 'strong beliefs', 'nature benefits humans', 'high expectations from nature' and 'climate change as veiled' group together. These dynamics link to quantitative insights 1 (emotional connection to nature mediated through a dominant social paradigm), 2 (concerned about human-centric environmental problems), 5 (value conformity, tradition, achievement), and 6 (judging personality). Group B reinforces this group, as they need all of this to happen in the system to build their status as a hero. Group E also impacts Group D since it is a balancing feedback loop, in that 'seeking peace' underscores system processes such as having 'strong beliefs' and 'high expectations from nature'.

6.3.4.5 Dynamics of Group E

The MDS map shows 'seeking peace' as a process operating on its own, but impacting other system dynamics. This suggests that it is a process that helps the system function. This dynamic is linked to quantitative insights 1 (emotional connection to nature mediated through a dominant social paradigm), 3 (human ingenuity will solve environmental problems), and 4 (behave pro-environmentally in areas that have financial and nurturing benefits). Group E reinforces Group D and is impacted by Group A and potentially has a reinforcing impact with Group C. This typology will do anything if they believe it will keep human-centered peace, strengthen their role as a hero, and if it is situated within their belief system.

6.3.4.6 Hero typology theoretical statement and comparison

The theoretical statement is based on the joint display shown in figure 107.

People who identify as a *Hero* describe specific *characteristics of a hero* because they *had a hero*. Being a hero is about *helping* people as *building a legacy is important* and it provides a sense of *achievement*. Building a legacy means that you need to have *strong beliefs* and to progress unwaveringly in the world. These beliefs are expressed through the *value of conformity, tradition and achievement*. This is related to their personality, which tends to enjoy receiving information and then using that to organise and plan their activities in the world. The *Hero identifies as a nurturer* and part of nurturing is *seeking peace* in a world where peace for humans is threatened. This means that *they behave pro-environmentally in areas that have financial and nurturing benefits.* They are *concerned about human-centric environmental problems* such as *climate change, which might impact peace*. However, humans are at the center of their purpose because they can receive acknowledgement from humans and that is how they will leave a legacy. They also believe that *human ingenuity will solve environmental problems*. It is in this human-centric worldview where *nature is seen as something to benefit humans, which* indicates that *their emotional connection to nature is mediated through a dominant social paradigm*. They describe having *high expectations from nature* and often being disappointed in it, which might be part of their *judging personality*. They connect with nature through humans rather than through nature itself. Their lack of an authentic relationship with nature, combined with human-centricity, leads to their experience of *climate change as a phenomenon that is veiled*.

The *Hero* typology shows some similarity to the *Concerned* typology (Leiserowitz et al., 2009), who tend to perceive climate change as less of an immediate threat as they focus on the well-being of children. This is similar to the *Hero* system that is nurturing and prefers to focus on aspects that show immediate threat or reward. There is also some similarity to the *Caretakers* typology (Pike et al., 2008) that engages with environmental issues to ensure safe environments for their children and grandchildren. Aspects of the *Traditionalists* typology (Pike et al., 2008) that relate to the *Hero* typology are the belief that families and communities should take care of those in need, and that they are highly religious. The *Hero* typology valued religion most when ranking issues (0.664) and is the most religious typology in this study ($\overline{x}$ = 5.1). This degree of religiosity is expressed by both the *Hero,* and the *Steward of nature* typology (De Groot & Van den Born, 2003), who perceive humans as the owners of nature who have a responsibility towards God and future generations to take care of it. There is also similarity to the *Nature controllers* typology (Bauer et al., 2009) and the *Traditionalist* typology (Teel & Manfredo, 2010), who show conservative attitudes towards nature. Furthermore, there is some parallel to the *Resource-use relationship* typology (Berghöfer et al., 2008) that expresses some exploitative beliefs and behaviour towards nature. *Concerned consumers* (Defra, 2008) are similar to the *Hero* typology as they believe that they are doing more for the biosphere than they actually are.

Although there are some points of comparison with existing typologies regarding anthropocentric beliefs, psychological distance with regard to climate change, and degree of religiosity, those typologies are not fully formed, as they provide no broader explanation as to the underlying drivers and expressions of these beliefs. The *Hero* system is more complete than the *Concerned* typology (Leiserowitz et al., 2009) and the *Caretakers* typology (Pike et al., 2008) as it explains the reasons for distance from climate change and the focus on children as a process used to build a legacy. The *Hero* extends this understanding, showing how nature is seen as a tool for human-centric needs and how they interpret climate change as potentially impacting the peace they work so hard to maintain. Furthermore, the *Hero* system shows that individuals can connect with nature through other humans (rather than directly), which provides a deeper explanation for caring about other humans as seen in the *Traditionalists* typology (Pike et al., 2008). The *Steward of nature* typology (Van den Born, 2008) acknowledges taking care of nature as a responsibility towards God and future generations, but this is an incomplete understanding of their relationship with nature as it fails to explain why they feel this responsibility. The *Hero* system shows that these individuals have high expectations from nature and that they are often disappointed in nature, reinforcing their beliefs that nature is there to benefit humans. The *Nature controllers* typology (Bauer et al., 2009), *Resource-use relationship* typology (Berghöfer et al., 2008) and the *Traditionalist* typology (Teel & Manfredo, 2010) describe conservative and exploitative attitudes but without a broader conceptualisation for how that operates within a typological system. With this in mind, the *Hero* system shows how strong beliefs are linked to building a legacy, helping, being a nurturer, and keeping the peace, with the belief that nature needs to be used to achieve all of this.

6.3.5 Explorer typology system and theory

The main inputs for the building of the *Explore*r typological system and theory is Table 28 – Column E (summary of key quantitative results) and Figure 75 (the theoretical structure for the typology) in the

qualitative results chapter. Figure 108 shows the *Explorer* typology system and the emergence of six groups (A, B, C, D, E, and F) that link to the quantitative results. These groups consist of the properties that cluster together in a logical and coherent manner, based on the MDS (stress = 0.214).



Key quantitative insights	Links	Relationship between qualitative constructs
1. They are deeply concerned about nature and animals	B D E F	
2. They behave pro-environmentally	B F	
3. The explorer is open to the world	A C D F	
4. They are independent and curious	A C D F	
5. They are self-actualising	A B C D F	
6. They feel deeply and are intuitive	B C D E F	

Figure 108: A joint display showing the Explorer system

6.3.5.1 Dynamics Group A

The MDS map shows 'generational consciousness' and 'nature to be explored' grouping together. Their childhood experiences with nature feed into experiences as an adult that make spending time in nature something exciting, yet normal. Their childhood experiences and worldview leads them to view nature as something to be explored. This dynamic relates to quantitative insights 3 (open to the world), 4 (independent and curious), and 5 (self-actualising). These dynamics trigger the other processes we see in the system shown as Group E and Group, B. Group A impacts on Group E because of their childhood experiences and their attitude that nature is something to be explored, and with which they feel innate affinity and interconnectedness. This interconnectedness and kinship leads them to feel and experience climate change as something that is changing their relationship with nature. Group A also triggers Group B in that because they have a universal consciousness and an attitude that they can explore nature they feel an overarching connectedness that inspires them to make a difference in the world.

6.3.5.2 Dynamics Group B

The MDS map shows that 'connectedness' and 'making a difference' group together. Since they are open to the world through their universal values, they are inspired and empowered to make a difference. Each participant described ways in which they try to make a difference in the world. These dynamics relate to quantitative insights 1 (deeply concerned about nature and animals), 2 (behave pro-environmentally), 5 (self-actualising), and 6 (feel deeply about intersectional justice issues and are

intuitive in the way they move through the world). These dynamics are triggered by Group A, C, E, and F. Group A feeds into their ability to see nature as something to be explored, whether it is human or non-human in nature. This means that they are open to seeing where they can make a difference. Group C and their openness to the world and other types of people and cultures, means that they are not bounded in what they attempt to do to make a difference. This openness also means that they easily get along with others and that their compassion is generalised towards people, nature and animals. Group E includes 'biophilia' and 'interconnectedness' and awareness of how their relationship with nature is changing (because of climate change). This means that they are driven to make a difference through their connectedness. Group F shows that they feel connected to broader world experiences which means that they are sensitized to notice and respond affectively to crimes against nature.

6.3.5.3 Dynamics Group C

The MDS map shows that 'open to the world' and 'cultural openness' group together. Their openness to the world triggers a natural openness to other cultures. These dynamics relate to quantitative insights, 3 (open to the world), 4 (independent and curious), 5 (self-actualising), and 6 (feel deeply and are intuitive). Group C creates feedback with Group B and receives input from Group D. Group D influences Group C in that their exploratory worldview inspires their openness and because of this it reinforces the importance of human and non-human relationships.

6.3.5.4 Dynamics of Group D

The MDS map shows that 'relationships are important' and 'exploratory worldview' group together. This is perhaps because their worldview is not focused on themselves, as was found in typologies 1 or 6, and is more outward-focused on other people, animals, and nature. These dynamics relate to quantitative insights 3 (open to the world), 4 (independent and curious), 5 (self-actualising), and 6 (feel deeply and are intuitive). This creates a reinforcing feedback loop with Group C and triggers Group E. It triggers group E because their exploratory worldview means that they feel interconnected with the outside world and because all relationships are essential, they notice that climate change is changing their biophilic relationship with nature.

6.3.5.5 Dynamics of Group E

The MDS map shows that 'interconnectedness', 'biophilia', and 'climate change is changing the relationship' with nature group together. This is because their interdependence with nature reinforces their biophilia and this together makes climate change something that impacts them profoundly as well as their relationship with nature because nature is changing because of humanity, of which they are also a part. Group E is reinforced by Group A and Group D, and in turn this reinforces Group B and Group F. It impacts Group F because it makes them feel connected to broader world experiences and they are very aware and affected by what they perceive to be the crimes committed against nature.

6.3.5.6 Dynamics of Group F

The MDS map shows that 'connected to broader world experiences' and 'crimes against nature' group together. This is because their awareness impacts their ability to see injustices being committed against nature. Group F is reinforced by Group E and in turn reinforces Group B.

The *Explorer* system has groups that function close to each other and form reinforcing loops with each other because the system has open boundaries and a close and affective relationship with nature.

6.3.5.7 Explorer typology theoretical statement and comparison

The theoretical statement is based on the joint display shown in figure 108.

People who are *Explorers* are *open to the world* in part because their personality is oriented towards feeling deeply about intersectional justice issues and intuitive in the way they move through the world, making them more spiritual than religious as they are the least religious typology. *They are independent and curious*. They describe having an *exploratory worldview* and within that worldview, nature plays an important role in their lives as *something to be explored with* inherent and at times spiritual value. They value *universalism* which leads to them feeling *connected* to others, nature, and animals. They also describe a *cultural openness* that means they enjoy taking perspectives of how other people live and how they think. This connectedness means that all relationships are important to them even those distant (e.g. street children). This connectedness comes from them being *connected to broader world experiences* and it inspires them to *make a difference* in the world. They feel a deep, innate, and affective *interconnectedness* with nature and show *biophilia*. This leads to *feeling deeply concerned about nature and animals*. As a consequence, they see the *crimes against nature* being caused by humanity as well as by themselves. Their awareness of their own biophilia started at an early age and there is an emergence of a *generational consciousness*. They have a close relationship with nature and see *climate change as changing this relationship that they have with nature*. They are emotionally impacted by climate change threats because they *feel deeply and are intuitive*. *They are self-actualising* and therefore try to make individual changes (e.g. *behaving pro-environmentally*) to decrease their own impact. Whereas the *Hero* typology focuses on humans and they enjoy getting acknowledgement for what they do, the *Explorer* wants to make a difference to anybody in need (animals, nature, or people) and show humility in their actions.

The *Explorer* typology shows some similarity to non-materialistic and less religious aspects of the *Alarmed* typology (Leiserowitz et al., 2009). The *Explorer* is similar to the *Enthusiasts* typology (Poortinga & Darnton, 2016) in that they are very concerned about climate change and value self-transcendence. Similarities also exist with the *Man the participant in nature* typology (De Groot & Van den Born, 2003) and *Spiritual participant in nature* typology (Hunka et al., 2009) who believe in a strong physical and spiritual interconnectedness between humans and nature, similar to the Biophilia aspects of the *Explorer*. Furthermore, similarities exist with the *Nature-connected users* typology (Bauer et al., 2009), *Mutualist* (Teel & Manfredo, 2010), *Nature lovers* typology (Bauer et al., 2009), and *Greenest Americans* typology (Pike et al., 2008) who have utilitarian attitudes and value benevolence and

universalism. The *Explorer* shares environmental consciousness and concern for the biosphere with the *Positive greens* typology (Defra, 2008), *Green* typology (Awad, 2011), *Explorers* typology (Awad, 2011), and the *Sustainable consumers* typology (Balderjahn et al., 2018).

The above typologies are inadequate for explaining the deeper psychological processes that impact this type of human-nature nexus. The *Explorer* typology is more meaningful than the *Alarmed* typology (Leiserowitz et al., 2009) because it shows how non-materialism and being less religious influences their relationship with nature and the world, as it provides an environment in which they can show an openness to the world through the experience of interconnectedness. The *Explorer* system is more complete than the *Enthusiasts* typology (Poortinga & Darnton, 2016) that fails to describe the reasons *Enthusiasts* are concerned about climate change and what it means to value self-transcendence. The *Explorer* typology is different because it illustrates that concern about climate change is a consequence of their concern about intersectional justice issues and their affective relationship with the biosphere. It further shows that self-transcendence is a consequence of generational consciousness and being open to the world, which in turn impacts their ability to experience climate change as something that is changing their relationship with nature. The *Explorer* system also provides deeper and more meaningful context to the idea of interconnectedness between humans and nature compared to the *Man the participant in nature* typology (De Groot & Van den Born, 2003) and *Spiritual participant in nature* typology (De Groot & Drenthen, 2011) that provide superficial explanations. The *Nature-connected users* typology (Bauer et al., 2009), *Mutualist* (Teel & Manfredo, 2010), *Nature lovers* typology (Bauer et al., 2009), and *Greenest Americans* typology (Pike et al., 2008) are simplistic since they fail to explain how values operate within the broader individual system. Furthermore, the *Positive greens* (Defra, 2008), *Green* (Awad, 2011), *Explorers* (Awad, 2011), and the *Sustainable consumers* typologies (Balderjahn et al., 2018) do not explain where environmental concerns and consciousness comes from and what that means for the manner in which they move through the world. This contrasts with the *Explorer* system that shows links between generational consciousness, Biophilia, the importance of human and non-human relationships, and the experience of connectedness all impacting each other to coalesce towards a concern for the “crimes” being committed against the biosphere.

6.3.6 Hedonist typology system and theory

The main inputs for building the *Hedonist* typological system and theory is Table 28 – Column F (summary of key quantitative results) and Figure 89 (the theoretical structure for the typology) in the qualitative results chapter. Figure 109 shows the *Hedonist* typology system and the emergence of six groups (A, B, C, D, E, and F) that link to the quantitative results. These groups consist of the properties that cluster together in a logical and coherent manner, based on the MDS (stress = 0.184).

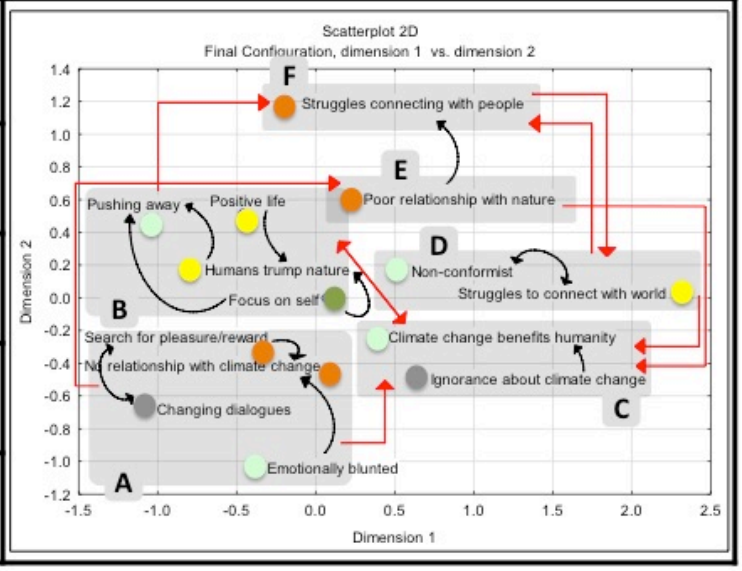
Key quantitative insights	Links	Relationship between qualitative constructs
1. They have a weak affective relationship with the biosphere and low environmental worldviews	A B C D E	
2. They are not concerned about environmental issues	A C E	
3. They do not behave pro-environmentally	E	
4. They value self-enhancement	A B	
5. They are indifferent to the outside world	D F	

Figure 109: A joint display showing the Hedonist system

6.3.6.1 Dynamics Group A

The MDS map shows ‘emotionally blunted’, ‘changing dialogues’, ‘no relationship with climate change’, and ‘search for pleasure/reward’ grouping together. This typology has a singular focus on things which bring them personal pleasure or reward. Since climate change is not something that brings either pleasure or reward for the self, they dismiss climate change (unconsciously) and show no relationship with the idea. This ability to dismiss elements in life that are perceived as conducive to non-pleasure means that they often operate as emotionally blunted towards other people or issues that others feel strongly about. Their emotional bluntness hampers their ability to connect with the world and therefore they create new ways of trying to create dialogue with the world in order to loop back to pleasure or reward. Their emotional bluntness makes it easier for them to dismiss climate change. This dynamic relates to quantitative insights 1 (weak affective relationship with the biosphere and low environmental worldviews), 2 (not concerned about environmental issues), and 4 (value self-enhancement). These dynamics trigger (shown in red) the other processes we see in the system shown as Group C and Group E. Their emotional bluntness, combined with their focus on pleasure/reward, means they change dialogues to suit themselves. Therefore they claim ignorance about climate change and naturally change the dialogue about climate change as something that benefits humanity (Group C). The dynamics of Group A also impacts Group E in that these processes mean that they struggle to connect to nature. Interestingly, the manner in which this system operates would suggest that if they are unable to form meaningful relationships with other humans it is likely that they will struggle to form relationships with the non-human world too because they are ‘switched off’.

6.3.6.2 Dynamics Group B

The MDS map shows that 'focus on self' (at the center of the map), 'humans trump nature', 'pushing away', and 'positive life' group together. They prioritise and value the self, and therefore they believe that humans are more special and more valuable than nature. Since humans are preferred over nature they push nature away in order to bring back the focus to the self. Positive life also emerges here suggesting that their positive life experiences feed into their idea that humans are superior. These dynamics relate to quantitative insights, 2 (not concerned about environmental issues), 4 (value self-enhancement), and 5 (indifferent to the outside world). These dynamics trigger Group C and Group F. These processes lead to creating positive feedback loops that feed into the belief that climate change is positive for humanity and the exclusion of any climate change knowledge as honest ignorance. Group B also impacts Group F. As a consequence of pushing away and focusing on themselves, they struggle to connect with other people.

6.3.6.3 Dynamics Group C

The MDS map shows that 'climate change benefits humanity' and 'ignorance about climate change' group together. They group together since it is ignorance that leads to the belief that a disaster like climate change is beneficial. These dynamics relate to quantitative insights 1 (weak affective relationship with the biosphere and low environmental worldviews) and 2 (not concerned about environmental issues). These dynamics also reinforce the processes described in Group B. It creates feedback with Group D, E, A, and B.

6.3.6.4 Dynamics of Group D

The MDS map shows that 'struggles to connect with the world' and 'non-conformist' group together. This suggests that they might be mutually reinforcing; because they struggle to connect with the world they cannot conform and because they cannot conform they struggle to connect to the outside world. These dynamics relate to quantitative insights 1 (weak affective relationship with the biosphere and low environmental worldviews) and 5 (indifferent to the outside world). This dynamic reinforces the processes in Group C because the way they think about climate change is different and maybe even controversial. They are likely to not feel emotionally burdened by their inability to connect. This creates feedback with Group C and F.

6.3.6.5 Dynamics of Group E

The MDS map shows that 'poor relationship with nature' sits between Group B and Group D and impacts Group C. These dynamics relate to quantitative insights 1 (weak affective relationship with the biosphere and low environmental worldviews) and 2 (not concerned about environmental issues). Since they have a poor relationship with nature they don't care about climate change (Group C). Being emotionally blunted and searching for relationships and experiences that bring pleasure or reward (Group A), reinforces their poor relationship with nature. Nature and climate change do not represent pleasure for the self and therefore they disconnect from these in the same way they disconnect from people.

6.3.6.6 Dynamics of Group F

The MDS map shows that 'struggles to connect with people' sits close to 'poor relationship with nature'. Their struggle to connect with people reinforces their inability to connect with the world and their need to be non-conformist. These dynamics relate to quantitative insight 5 (indifferent to the outside world). This creates feedback with Group B and D.

6.3.6.7 Hedonist typology theoretical statement and comparison

The theoretical statement is based on the joint display shown in figure 109.

People who are Hedonists structure their lives in *search for pleasure or reward*. This means that they *focus on themselves* and *value self-enhancement*. They generally experience a *positive life* although they are *indifferent to the outside world*, are *non-conformists,* and they *struggle connecting with people*. Their struggles to connect also extend to *struggling to connect with the world* and this is partially due to the fact that their personality shows indifference, a lack of attaching value to objects, people, or events, and they are *emotionally blunted*. They struggle to feel emotion and to understand emotions in others. It is possible that their lack of emotion increases the need to seek pleasure and reward, as they need to find something to feel. Since they struggle to connect with the world they *change dialogues* to find a way to connect and they do this through alternative means like technology, art, or literature. Their struggles to connect extend to nature as they have a *poor affective relationship with nature* and *low environmental worldviews*. They believe that *humans trump nature* since humans have more impressive achievements, and in order to substantiate this interpretation of nature they engage in the process of *pushing nature away* through making negative associations with nature or redefining nature. Therefore, *they are not concerned about environmental issues* and *they do not behave pro-environmentally*. Their apathy towards nature extends to climate change and they show *no relationship with climate change* and are *ignorant* about it. In order to deal with their climate change apathy and reconcile it with their need to find pleasure and reward they redefine *climate change as something that benefits humanity*.

The *Hedonist* typology is similar to the *Driven independents* typology (Pike et al., 2008) that does not worry much about what others think of them. Aspects of the *Hedonist* typology can be seen in the *Dismissive* typology (Leiserowitz et al., 2009) that believes climate change is not happening and that humans are not the cause. This is similar to the *Self-reliant* typology (Poortinga & Darnton, 2016) that is skeptical about climate change and scored low on self-transcendence values. There is a similarity between the *Hedonist* and the *Undevoted* typology (Awad, 2011) and the *Honestly disengaged* typology (Defra, 2008) who have no concern about the biosphere and who live environmentally recklessly and their beliefs are similar to the *Man the adventurer and exploiter of nature* typology (De Groot & Van den Born, 2003) who think that environmental problems will be solved through technology and science and that economic growth is paramount. This relates to the *Materialists* typology (Pike et al., 2008) that focuses on materialistic gain and engages in risky behaviour like the *Vacationer* typology (Cini et al., 2012) for which it is all about fun and escape.

The *Hedonist* system demonstrates a more meaningful explanation of how non-conformism, focus on self, and search for pleasure/reward lead to being careless about what others think of them, compared to the *Driven independents* typology (Pike et al., 2008), which fails to provide a deeper context for carelessness. The *Dismissive* typology (Leiserowitz et al., 2009) and *Self-reliant* typology (Poortinga & Darnton, 2016) are problematic as they fail to provide context of the type of affective relationship these typologies have with nature that leads to their denialist attitudes towards climate change. The *Undevoted* typology (Awad, 2011) and the *Honestly disengaged* typology (Defra, 2008) are simplistic in that they fail to explain the underlying psychological drivers that lead to a lack of concern about the biosphere and living environmentally recklessly. The *Hedonist* system is a superior conceptualisation of these apathetic biospheric and climate change attitudes as it shows that these types of individuals believe that humans are more important than nature, and that they have no relationship with nature or climate change. Furthermore, because they only pay attention to aspects in life that provide immediate and direct pleasure, nature and climate change are made profane by this system. Although *Man the adventurer and exploiter of nature* (De Groot & Van den Born, 2003), *Materialists* (Pike et al., 2008) and *Vacationer* (Cini et al., 2012) acknowledge the technological and economic beliefs of this type, the *Hedonist* system shows how these beliefs operate within a system that functions in a state of seeking pleasure or reward leading to beliefs that climate change will benefit humanity.

The above discussion described the six individual typological systems that emerged and provided a deeper and more theory-driven explanation of the human-nature nexus in South Africa. These typological systems are more complete than previous typologies as they take into consideration individual psychological factors, the role of context, and life experiences in understanding the human-nature nexus and how this interacts with other psychologically processes. This systemic way of understanding the human-nature nexus has contributed to and furthered understanding by showing that events during life that are unrelated to nature and climate change could impact how individuals relate to and perceive nature and climate change, because of the manner in which systems function, particularly the aspects of interconnectedness. This research also demonstrates how non-environmental aspects can be used to influence environmental behaviour. For example, in the case of the *Hero* typology, communicating with clarity the way in which climate change will impact the future of peace and future generations might draw their attention. Mostly, the study manages to stretch traditional and dualistic psychological approaches by expanding the individual system to include nature and climate change as multi-dimensional and connected processes. The study shows that there cannot be an understanding of the human-nature nexus without understanding the individual, and there cannot be an understanding of climate change attitudes, beliefs and perceptions without understanding the individual and the nature nexus because there is no separation between the individual, nature, and climate change. The typologies are different to existing types because of their depth, the systems structure of individual functioning, the inclusion of nature and climate change as part of the individual system, and the contribution of new empirically-based theory to the field of climate and ecopsychology. Furthermore, the study suggests that there is an emergence of different types of systems based on the understanding of individual systems that could be used to guide targeted, yet nuanced, interventions strategies.

6.4 Types of systems

Based on the above individual systems dynamics and Figure 25 (A Venn wheel showing the relationship between typologies on variables) that explains how each typology functions in relation to each other, the biosphere and associated theory, there emerges three types of systems, namely isolated systems, transitory systems, and connected systems. These types of systems have various dimensions based on their nature-nexus and oscillations between self and world shown in Figure 110.

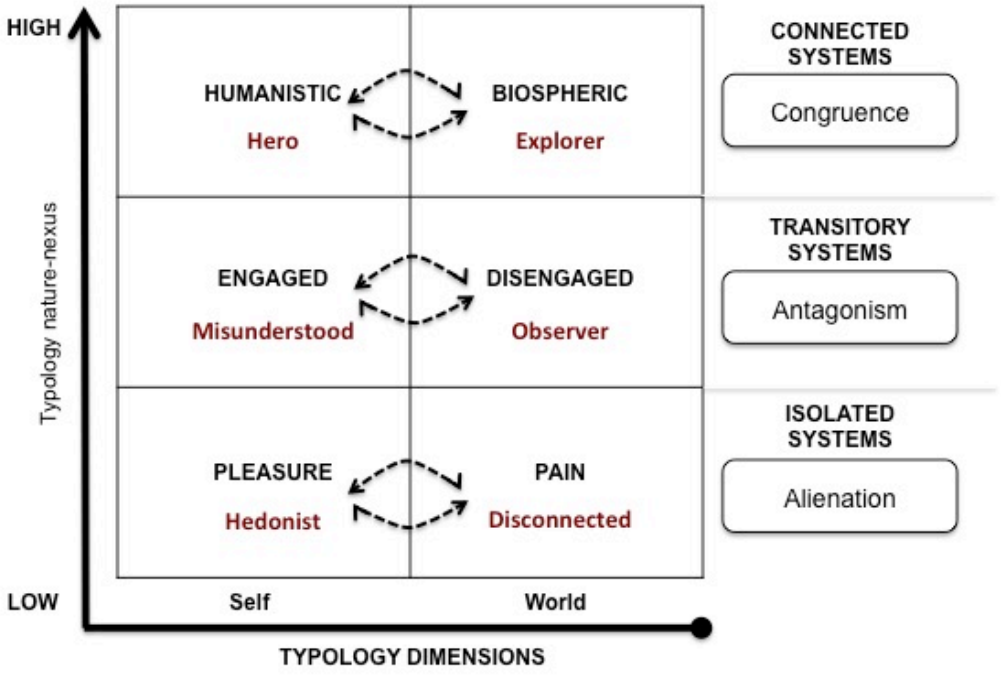


Figure 110: Three types of systems

Isolated systems are characterised by low connectedness to the biosphere and alienation. These systems move between two dimensions; namely pleasure and pain. The experience of pain leads the *Disconnected* typology to seek pleasure (or seek to reduce pain). Through a focus on pleasure, the *Hedonist* typology avoids pain (or avoids elements that don't provide pleasure). Isolated systems reach false (destructive) symbiosis with the natural world through overexploitation at the cost of the biosphere (Andrews & Hoggett, 2019). Their relationship is destructive because they are alienated from the biosphere and have a narrow focus that prioritises the individual self in the world.

Transitory systems are characterised by moderate connectedness to the biosphere and antagonism. These systems move between the two dimensions of engagement and disengagement. Since the *Misunderstood* typology feels overwhelmed by the pain in the world they try to disengage (through justification mechanisms like harm reduction). The *Observer* typology functions in a disengaged state but wants to engage because it provides them with a sense of belonging. The movement between engagement and disengagement creates antagonism for these types of systems. They are labeled transitory systems because they are not alienated and not in congruence with the biosphere. Rather, they touch on experiences of connectedness with the biosphere but are in constant flux seeking connectedness, albeit often through using cognitive strategies (Ito, Man, & Li, 2019).

Connected systems are characterised by high connectedness to the biosphere and congruence. These systems move between two dimensions, namely humanistic and biospheric, that are both related to environmentalism (Saunders et al., 2005). The *Explorer* typology feels connected and open to the experience of both humans and non-humans. The *Hero* typology values the biosphere for what it means for humanistic survival and they see nature in children.

The pleasure, engaged, and humanistic dimensions of the *Hedonist*, *Misunderstood* and *Hero* show a strong focus on self, making it the primary boundary (Midgley, 1994). The *Hedonist* focuses on providing pleasure for the self, the *Misunderstood* focuses on the subjective self, and the *Hero* focuses on building a legacy for the self. The pain, disengaged and biospheric dimensions of the *Disconnected*, *Observer* and *Explorer* place the world as a primary boundary (Midgley, 1994). The *Disconnected* yearn for a sense of belonging, for the *Observer* the world represents an opportunity to follow and belong, and for the *Explorer* typology the world represents people and nature, new experiences and opportunities to make a difference. This study shows that system boundaries are more complex than just those relating to anthropocentrism versus biocentrism. It demonstrates that a system that marginalises the biosphere does so for various reasons and not only because of anthropocentric motivations. From this study, using the understanding of the different typological systems, associated theory in relation to what types of system they are, and their oscillations between self and world can be used to shape campaigns or appropriate interventions. The various levels of understanding allow for more nuanced targeting that aims to meet individuals and systems types where they are intrinsically, cognitively, affectively, and behaviourally in relation to the biosphere.

6.4.1 Targeting types of systems

Understanding the complexity inherent in typological systems is valuable when designing effective and strategic marketing communication that resonates with intrinsic, affective (emotion), cognitive, and behavioural aspects of an individual (Carey et al., 2019) and system functioning. The key to effective intervention strategies is to design them using a system-type understanding combined with the nuanced structures of the individual typologies within the context of the targeted problem. This section provides some suggestions of interventions for each type of system, but these will vary greatly depending on the context of the environmental problem to be addressed and the expected outcomes.

Isolated systems move between seeking pleasure or avoiding pain and there is a constant movement between self and the world. Affective and cognitive strategies targeting these types of systems could focus on trying to get these systems to be more open to the world through ecopsychology practices (Jordan, 2015) such as nature-based expressive arts therapy (Atkins & Snyder, 2018) and sensorial activities (Macy & Brown, 2014) that address their biospheric alienation. One such sensorial activity suggested by Cohen (2007) is to challenge biospheric alienation by asking participants to go to an attractive natural area and ask them to wrap a towel or piece of clothing around one of their hands. With their eyes closed, they are asked to explore the natural elements in the immediate area gently, with both wrapped and unwrapped hands. This exercise is repeated by keeping their eyes open. Participants are then asked to write down their experiences. Cohen (2007) shares a response from one of his

participants: *"The covered hand was warmer and more protected, but it seldom felt the outside world and it wanted to. It was frustrated. It sensed things differently than did the bare hand. It was comparatively numb and uninteresting"* (p. 74). Behavioural strategies would need to consider that these systems behave in ways that prioritise the individual and therefore, in order to encourage sustainable behaviour, this would need to be done through policy that targets individualistic behaviour or technology that positions sustainable behaviour as individualistically rewarding. Positive incentives (Steg & Vlek, 2009) for eco-friendly behaviour, such as getting money back for recycling, could be effective in changing behaviour without having to change dominant worldviews of these systems. Strategies targeting intrinsic system processes would benefit from using hedonism (providing pleasure), achievement (doing better than others), and power (being in control) to frame and promote sustainable behaviours and mindsets (Kwan, Naidu, & Bixter, 2019). Sustainable behaviour strategies that benefit individuals financially were tested amongst 122 private housing estates in Hong Kong and they found that a significant positive relationship was possible between economic incentives and recycling behaviour (Yau, 2010). On the other hand, sanctions that disincentivise unsustainable behaviours, could be considered for this type of system (Axon, 2017) in the shape of Pigouvian taxes (i.e. government cost on activities that create a negative effect on others in a society, but not necessarily the person who does that activity) (Glaeser, 2014). Furthermore, strategies for alternative hedonism might be worthwhile exploring with these types of systems. Alternative hedonism (Soper, 2007) is a process whereby sustainable behaviour is positioned as a status symbol, personally rewarding, or a process of individual distinction, rather than based on altruistic concern. Any intervention strategies for these types of systems need to avoid triggering fears of ontological insecurity (Andrews & Hoggett, 2019; Norgaard, 2006).

Transitory systems move between engagement and disengagement, which makes them antagonistic. What the *Observer* and *Misunderstood* typologies have in common is that they are in flux and experience tensions between the self and the world. Affective and cognitive strategies targeting these types of systems could focus on reducing these tensions using narrative (rather than factual) environmental news stories that focus on negative consequences of behaviours which could increase positive emotional impact and generate supportive responses (Shen, Ahern, & Baker, 2014). The contexts for these narratives would need to consider the nuanced contexts of the *Misunderstood* and *Observer* systems. Another approach is feedback-signaling consequence which entails providing transitory systems with feedback as to the impact of their own behaviour on the environment (for the *Misunderstood* this would be feedback on the impact of their harm reduction behaviours and for the *Observer* this could be feedback on how collective behavioural change impacts the well-being of the environment) (Dwyer et al., 1993). Further affective strategies could focus on deepening their relationship with the biosphere with green psychotherapy that educates and counsels within a natural setting (Cohen, 2007; Jordan, 2015) and at the same time trying to avoid alienation. There could also be a focus on promoting deep adaptation strategies (Bendell, 2018) through the use of empathy and distress (Lee & Holden, 1999) based on the environmental plight of others (for the *Misunderstood* the "other" would be nature/animals and for the *Observer* the "other" would be close family) that could potentially drive personal action. Another affective strategy is community- or family-based interventions (Kahn & Morris, 2009) or a social norms approach (telling them what other people in their social groups do) (Handgraaf, Van Lidth de Jeude, & Appelt, 2013) focused on elements that are important to the

nuanced communities the *Misunderstood* might find himself or herself in (like activist, vegan or LGBTI groups), and for the *Observer* this would be family and close communities (Kahn & Morris, 2009). Behavioural strategies might benefit from a focus on reducing guilt (Kwan et al., 2019) through low-commitment active citizenship opportunities that include political activities that are less public or present less risk than engaged activism, for example writing letters to government officials or contributing funds towards environmentally related issues (Stern, Dietz, Abel, Guagnano, & Kalof, 1999) that fits within the contexts of the *Misunderstood* and the *Observer* types. These strategies might assist in shifting these types of systems towards having a stronger internal locus of control (Bendell, 2018; Landry, Gifford, Milfont, Weeks, & Arnocky, 2018; Wicks, 2011). Increasing awareness and access to information (Axon, 2017) through discussion of global warming with friends and family (Goldberg, Van der Linden, Maibach, & Leiserowitz, 2019) will assist the *Observer* typology to connect more with biospheric issues and assist the *Misunderstood* typology in their harm-reduction activities.

Connected systems value the biosphere and humans for different, yet complementary, reasons. Affective strategies (using emotion) could focus on empowerment that allows these systems to work and lead communities towards sustainable practices through organized group activity that produces collective efficacy (Oskamp, 2000). The *Hero* and *Explorer* types are likely to embrace leadership in collective activities since they have a strong internal locus of control. More specifically, public social rewards (e.g. praise given when positive goals are achieved) might be an effective way to stimulate pro-environmental behaviour (Handgraaf et al., 2013) in conjunction with a cognitive strategy that provides access to salient, digestible scientific information about the state of the planet so that they are equipped to disseminate this information (Kwan et al., 2019). Behavioural strategies could focus on including these types of individuals in campaign and policy evaluations to provide inputs regarding leading potential grassroots projects. Grassroots activism has been a powerful force globally against environmental racism and environmental injustice and has managed to improve the manner in which health and environmental policies are structured. The success of these grassroots movements has led to environmentalism being seen as an issue that requires equal attention to that of social justice and civil rights (Bullard & Johnson, 2000). Intrinsic strategies could focus on support programs for traditional people-centric (*Hero*) versus non-traditional bio-centric (*Explorer*) ways of perceiving and reacting to the environmental crisis. One way of bringing the two together is through community food gardens as these help feed people and address environmental issues related to non-organic foods and issues like food security (Kingsley & Townsend, 2006). Lastly, extending their environmental behaviour into various contexts rather than just those associated with the home, and into different consumption spaces (Barr, Gilg, & Shaw, 2013) could have traction when positioned as voluntary simplicity (i.e. living lightly on the earth) (Oskamp, 2000).

The above section described some examples of interventions that could be used to target different types of systems but the type of intervention would depend on the context, problem to be addressed, strategy, and outcome goals. Furthermore, efficacy of interventions is greatly improved when using a combination of types of interventions (e.g. information strategies together with normative pressure or removing barriers to change) (Oskamp, 2000). The above suggestions require further research to understand which types of interventions would work best for different types of systems and the associated typologies

in order to move them towards stronger congruence with the biosphere. Affective connectedness with the biosphere is important because what people care for, they will protect (Roszak, 1992). However, increasing affective connectedness is not a linear problem that can be solved through simplistic approaches and generalised assumptions about individuals. As this study has shown, there are different types of people with different types of relationships with the biosphere and these relationships are formed through a system of action and interactions of affective, intrinsic, behavioural, and cognitive aspects. Therefore, to increase affective biospheric congruence, this complexity needs to be taken into account.

6.5 Summary

The study suggests that understanding the human-nature nexus goes beyond determining values, behaviour, and other linear aspects because the relationship with the biosphere is complex, multi-factorial, and cumulative and cannot be determined or understood using limited variables, methodologies, or linear exploration. The study expands findings by Anderson et al. (2010), Franzen and Vogl (2013), Siegfried (2014) and Struwig (2010), in which South Africa ranks as one of the countries with the least environmental concern out of 33 countries and differences between individuals are linearly determined by looking at economic or geographical differences. This study shows that different people in South Africa relate differently to the biosphere for various complex reasons and because of a range of processes. In order to make sense of this complexity this study used a systems thinking approach to build theory about the South Africa human-nature nexus. Since individuals are complex systems, in order to understand the human-nature nexus their biospheric attitudes, beliefs, and understanding cannot be isolated from other aspects of the their lives and experiences. This study aimed to integrate various emerging aspects that might explain the nexus at a deeper and more theoretical level. In order for campaigns and other advocacy approaches to be truly effective they need to consider where individuals are intrinsically, behaviourally, affectively, and cognitively. This study provides insights into the interactions and psychological processes that function within these four elements, and can provide rich and powerful views into the relationships individuals have with the biosphere. Lastly, the study finding suggests ways in which ecopsychology could be used in South Africa and what that could mean for sustainability (Lockhart, 2011).

CHAPTER 7

CONCLUSION

7.1 Introduction

The field of ecopsychology was developed in response to the environmental demise as practitioners realised that generalised fear messaging was not working to persuade individuals to change their environmentally destructive behaviour. Ecopsychology, therefore, focuses on the affective relationship between individuals and nature, which is based on the premise that what individuals love and care for, they will protect (Roszak, 1992). This relates to a study conducted by Kwan et al. (2019) who found that knowledge-based interventions are most effective when the information provided resonates with the person and individual needs are taken into account. Taking an individualised approach, rather than a cultural one, deals with the environmental crises as anthropogenic and recognises that politicians, business owners, teachers and community leaders are also individuals who operate in the world as complex systems motivated by an interaction of various intrinsic, affective, cognitive, and behavioural processes. According to Goldberg et al. (2019), discussing global warming will make people more open to accepting climate science. However, this study suggests that understanding the underlying psychological processes of different types of individuals is imperative in order to communicate effectively based on the specific aspects that will resonate with individuals.

7.2 A synopsis

Although environmental-related typologies have been identified and explored in the past, their complexity and theoretical value as systems has been poorly explored. This study aimed to address existing gaps pertaining to the fact that most typologies identified were done so in developed countries, used limited variables, simplistic singular methods, and typically excluded environmental affect and individual personality. These studies failed to interpret typologies as complex systems that, when explored, can build theory that adds value to the fields of climate psychology, ecopsychology, and environmental psychology. Based on the gaps identified, the study used an explanatory, sequential, mixed-methods design to answer the following research questions:

1. Based on people's relationship with the biosphere and individual differences, which typologies exist in South Africa?
2. How do typologies differ from each other?
3. What typologies describe South African individuals' reported relationships with the biosphere and how are these types explained through experiential accounts?
4. What ecopsychological theory can be developed to describe each of the identified typologies?

The study identified six meaningful and well-differentiated typologies that exist, based on their relationship to the biosphere and individual differences. These typologies are the *Disconnected*, *Observer*, *Misunderstood*, *Hero*, *Explorer,* and *Hedonist*. The quantitative chapter described significant differences between the typologies based on clustering and profiling variables. The qualitative Gounded

Theory Analysis built typological theory and provided categories and properties to build typological systems which were presented in the integrative chapter.

7.3 Study contribution

Overall the study contributes new and expansive knowledge and theory to the field of ecopsychology. The understanding of deep psychological systems and processes can be beneficial when designing and implementing effective strategies for climate change mitigation and adaptation. Understanding nuances between different types of people allows for informed environmental policy development (Dalal-Clayton & Bass, 2009), green technology development and adoption, therapeutic interventions, pedagogical approaches, and marketing efforts (Dwyer, 1993; Maibach et al., 2009) that targets individuals using their psychological profiles as a basis. That is to say that using non-environmental motivations could lead to environmental behaviours when approached correctly.

The *Disconnected* typology and system is richer and more theory-driven than previous typologies in that it demonstrates how personal experiences, such as abandonment (Burnstein, 1981) can impact the relationship that individuals have with the biosphere without these abandoning experiences being directly related to the biosphere. Abandonment experiences lead to feeling insecure (Burnstein, 1981; Leary, 2009), an external locus of control, and pushing people into a state of emotional survival (that can be exacerbated by financial survival) (Dunlap, 1994), and subsequently impacting their ability to maintain relationships (Mallinckrodt & Bennett, 1992; Price, Choi, & Vinokur, 2002) of which, this theory shows, the human-nature relationship is one. They try and protect themselves from further unpleasant feelings and ontological dread through the process of emotional disconnection (Norgaard, 2006; Wicks, 2011). Individuals who experience the world as unsafe, prioritise control and security and that often leads to authoritarian ideological beliefs (Stanley & Wilson, 2019) that make them consider themselves as superior to the biosphere.

The *Observer* typology demonstrates how having an observer-type worldview impacts climate change and environmental interactions in that these types of people go through life often in a state of voyeurism. It shows that an approach heavily reliant on information-seeking is used as a method to emotionally distance themselves (Norgaard, 2006). They show artificial acceptance of concerning information and don't take personal action, which is counter to the knowledge-behaviour gap theory (Berghöfer et al., 2008). The undercurrent of conformity further implies a lack of personal action, interaction and concern, especially in the absence of a strong emotional connection with nature. As such, people in this typology function as bystanders (Wicks, 2011) to what is happening with the biosphere unless social norms dictate otherwise (Kaiser & Fuhrer, 2003).

The *Misunderstood* typology reveals the impact that deeply negative life experiences can have on how some individuals relate to the world, including the biosphere. This, combined with individual traits such as being non-comformist, feeling like an outsider and being introverted (DeLongis & Holtzman, 2005), shows that they are fearful and have a sense of shared victimhood with the biosphere which leads to climate change being interpreted as a potential traumatic experience (Obradovich, Migliorini, Paulus, &

Rahwan, 2018). This research also shows that the emotional burden of witnessing a changing nature can have on these types of individuals and how that might reinforce a feeling of helplessness, eco-anxiety and frustration (Landry et al., 2018; Lertzman, 2015).

The *Hero* typology shows how people who want to be heroes and build a legacy approach their relationship with nature and climate change. It supports the existing understanding that religion encourages the belief that the earth and animals are objects to be exploited for the benefit of humankind (Arbuckle & Konisky, 2015; Lovelock, 2006) by framing it within the human-centric, dominant paradigm and showing how that allows for heroic tendencies. The theory shows that climate change has no immediate reward and therefore is not a focus for people in this typology because doing something towards the long-term survival of humanity has no short-term acknowledging benefits for them. However, their need to nurture, especially through children, as well as to retain peace, provides clues as to how to potentially engage this typology with the plight of the biosphere.

The *Explorer* typology is richer and more theory-driven than previous typologies in that it demonstrates the importance of biocentric generational consciousness. Furthermore, it suggests that those individuals who care deeply about the environment are likely to be open to intersectional justice advocacy as they see plight in both human and non-human worlds (Hamer, McFarland, & Penczek, 2019). It further shows what individuals typically look like who experience a meaningful life and want to make a difference (Firth, 2008; Jia, Soucie, Alisat, Curtin, & Pratt, 2017). It suggests that this is the typology that might also be psychologically affected by climate change (Lertzman, 2012) and is explained through a new field of study related to biospheric loss (Berry et al., 2018). Previous studies were unable to explain why typologies concerned about the biosphere still do not act pro-environmentally. This study shows that pro-environmental behaviour for these types of individuals goes beyond using LED lights or driving less. Based on this, pro-environmental behaviour needs to be broader in its definition to include moral behavioural choices made, such as choosing not to have children or eating no (or less) meat, as is the case with this typology who showed increased consciousness about universal environmental issues.

The *Hedonist* typology shows a system in which objective self-awareness operates in relation to the biosphere. Objective self-awareness has been linked to decreased affect towards others and nature, encouraging exploitative and entitlement traits (Frantz et al., 2005) leading to reduced well-being (Beddoe et al., 2009). This study shows that the underlying driver for this worldview is the unwillingness to incur personal sacrifices for the sake of society and the biosphere (Naderi, 2018) combined with their apathy. Furthermore, their way of thinking about the world seems to be intrinsically driven as they mainly share positive life experiences, which suggests that no abnormal experiences shape this narcissistic life. This typology has a narrow concept of the world that is purely based on aspects of life that provide them with the most pleasure and the least individual sacrifice.

These typologies are deeper and more theory-driven than previous typologies and show the importance of taking affect, personality and other experiences and system processes into account when aiming to understand the human-nature nexus. Furthermore, the study explains the reasons why individuals have these worldviews that underpin their relationship with the biosphere. It uses individual stories to capture

the way in which typologies make sense of their thoughts and behaviour towards the biosphere. This understanding of individuals has various implications.

7.4 Implication of the study

According to the World Health Organisation, understanding systems before designing interventions and evaluations is imperative when dealing with climate change (Berry et al., 2018). Furthermore, understanding sustainable lifestyles is ambiguous if there is an absence of differentiation between different types of individuals and the deeper drivers, like affect, that impact their worldviews and behaviours (Axon, 2017). Interventions should be individually targeted, instead of following a generic approach (Poškus & Žukauskienė, 2017).

> "*Too long has sustainable behaviour been researched in a variable oriented way. We feel that there is an abundance of general models that describe populations, while the actual person has been neglected. Future research on sustainable behaviour should delve deeper into the person-oriented approach, trying to understand what drives a person to be sustainable. Understanding different types of people and what drives them to behave sustainably, what affects their beliefs, would prove to be extremely useful in creating effective interventions that promote sustainable behaviour"* (Poškus & Žukauskienė, 2017, p. 63).

The study provides a platform for environmentally focused momentum in South Africa using a typological approach to address the environmental crises. Although the study is valuable in identifying and describing typologies in a specific portion of the South African population from a systems and theoretical point of view, some limitations need to be considered.

7.5 Limitations of the study

Poor urban and rural South Africans, although the group most exposed to environmental hazards, and lacking decision-making power (Bouvier, 2004), were excluded from the study. The sampling strategy for the study deliberately targeted middle and upper class individuals who have the highest carbon footprints (Kharas, 2017; Odhiambo, 2011), decision-making power, online access and the English language competency required for participation. Including poor urban and rural South Africans risked encountering language and reading-ability difficulties that might have jeopardised the validity of the findings. Excluding them from the study sample means that the typologies are not generalisable to this section of the population and need to be validated with them in future research.

A further limitation of the study is that it is unable to determine how large each of the typologies are in South Africa and whether there might be geographic differences in their emergence, with more typologies occurring in one region rather than another. This would be an important determinant for intervention strategies as they might be more effective if designed around the primary typological occurrence in an area.

Another possible limitation is the use of an explanatory, sequential, mixed methods approach to obtain depth rather than breadth. Although mixed methods are valuable because they provide a platform to enhance and provide a depth understanding of the quantitative findings (Feilzer, 2010) it means that the findings are not necessarily generalisable to the entire South African population. That being said, the pragmatic approach of mixed-methods has great value as it allowed for typologies to be identified and then explored using grounded analysis.

The study would have benefited from a longitudinal element that determines whether individuals are able to move between typologies based on experiences and exposures to events and information. These limitations provide guidance for future research.

7.6 Future research

The study has provided a valuable baseline framework for other researchers to consider since a shortened typological questionnaire is available. Some of these future research concepts are:

- Sizing typologies in South Africa to determine how many people of each typology exist in the country
- Spatially mapping typologies that will contribute further understanding to typologies that might be more prevalent amongst rural farming communities (Restall & Conrad, 2015) versus those in urban areas. This data will assist in biodiversity protection strategies and educational campaign budgets
- Linking typologies with sets of behaviours and determining decision-making as established with game theory would be valuable.
- Duplicating the study amongst poor urban and rural South Africans and also in other African countries for comparative purposes
- Conduct cross-country research to determine typological presence outside Africa to build a grand theory of the human-nature nexus
- Testing various intervention ideas, policy strategies and communication campaigns with typologies looking at messaging that includes intrinsic, cognitive, affective and behavioural notes. This will create a blueprint for strategies that can be used by future practitioners
- Nature therapy practices used in relation to each typology would be insightful in order to determine how they respond to nature and what impact that has on their relationship with the biosphere
- The typologies could be useful for pre-testing communication campaigns as in the case of ‘day zero’ in cities
- A study that explores wellbeing correlations with each typology would prove valuable
- Investigating how typologies perceive risk perception would be useful for climate change strategies
- Since behaviour did not emerge as a strong differentiator for any particular typology, there is potential for future research to explore observed behaviour (especially those with moralistic motivations), rather than self-reported behaviour (the case with this study) in order to ascertain whether typologies could predict actual behaviour

7.7 Conclusion

Before new fields like climate- and eco-psychology, psychology tended to have a dualistic approach where the individual is separate from nature, and the challenges that individuals face are dealt with as

distinct from challenges experienced by the biosphere. The human-nature nexus was typically understood superficially and anthropocentrically. However, during a time of planetary asphyxiation, research that aims to explore the complex relationship between individuals and nature is becoming more important, and approaches that reinforce separateness, more problematic. It is individuals that run organisations and institutions, are behind policy and decision-making that impact the natural biota, and it is them that make choices every day in their lives that either promote planetary collapse or not. Therefore, gaining a deeper understanding of individuals and their relationship with the biosphere is critical.

This study challenged previous conceptions of the human-nature nexus (that typically reinforce superficial understandings) by taking a more in-depth exploration as to the aspects that influence and determine the relationship that individuals have with the biosphere. To effectively address the anthropogenic environmental crisis, as practitioners, we have to work with the deeper psychological processes that influence attitudes, beliefs, affect, cognition, and subsequently behaviour towards the biosphere. This study demonstrated that superficial expositions are inadequate without taking cognisance of the individual as a system that extends towards the biosphere and climate change.

This study showed that individuals are not only complex, but that their relationship with the biosphere is complicated and influenced, not only by their individual traits, but also by life experiences and other broader factors. The results from this study show the importance of working with affect as a holistic determinant of the human-nature nexus and also as the solution to encourage individual pro-environmental behaviours. What people care for, they will protect. Therefore, this study is critical because it shows the various access points for targeting the planetary crisis from aspects that are important to individuals, and within a context that resonates with them. The study demonstrates that typologies need to be targeted using different approaches because individual systems function differently and are influenced differently. This study also promotes the understanding that the human-nature nexus is determined by individual experiences, self-concepts, worldviews and beliefs that might seem disconnected from the biosphere, but is in fact part of the broader system of understanding..

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Appendix 1: Ethical clearance certificate

Research Office

HUMAN RESEARCH ETHICS COMMITTEE (NON-MEDICAL)
R14/49 Marais

CLEARANCE CERTIFICATE	**PROTOCOL NUMBER: H15/11/15**
PROJECT TITLE	Developing typologies to use as an ecopsychological framework for understanding the connnection that people have with the biosphere in South Africa
INVESTIGATOR(S)	Ms A Marais
SCHOOL/DEPARTMENT	Human & Community Development/
DATE CONSIDERED	23 October 2015
DECISION OF THE COMMITTEE	Approved unconditionally
EXPIRY DATE	19 January 2019

DATE 20 January 2016 **CHAIRPERSON** J. Knight
(Professor J Knight)

cc: Supervisor : Professor A Thatcher

DECLARATION OF INVESTIGATOR(S)

To be completed in duplicate and **ONE COPY** returned to the Secretary at Room 10005, 10th Floor, Senate House, University.

I/We fully understand the conditions under which I am/we are authorized to carry out the abovementioned research and I/we guarantee to ensure compliance with these conditions. Should any departure to be contemplated from the research procedure as approved I/we undertake to resubmit the protocol to the Committee. **I agree to completion of a yearly progress report.**

_____ _____/_____/_____
Signature **Date**

PLEASE QUOTE THE PROTOCOL NUMBER ON ALL ENQUIRIES

8 January 2016

Appendix 2: Participant information sheet

Dear potential participant,

I am Andrea Marais and currently busy completing my PhD in Psychology. This research forms the basis for my PhD studies at University of Witwatersrand.

My study aims to understand people's beliefs, attitudes, values and behaviour towards the environment. The study will be conducted in two phases. I would like to invite you to participate.

The first phase is an online questionnaire that will take approximately one hour to complete. During the last stage of the questionnaire you will be redirected to another site to complete the final set of questions. This is necessary as the final questionnaire is copyrighted. Note that all your details requested on this site will be treated confidentially, be protected and will not be used for any other purpose other than this research.

If you choose to participate, you will be invited to provide your personal details so that you can be entered into a lucky draw after having completed the questionnaire and all the questions.
1st Prize: Smartphone to the value of R5000
2nd Prize: R3000 Faithful to Nature online shopping voucher
3rd Prize: R2000 Faithful to Nature online shopping voucher
4th Prize: R300 Faithful to Nature online shopping voucher
5th Prize: R200 Faithful to Nature online shopping voucher

After completing the first phase of the research (online questionnaire) you can enter your details should you wish to volunteer to participate in phase two. Should you agree to participate in the second phase of the research note that you will no longer remain anonymous, as I will match your survey responses to the interview. You are in no way obligated to participate in phase two (in-depth interviews), after choosing to participate in phase one. By only participating in phase one of the research you will remain anonymous in the data set. For phase two I will randomly select and contact a group of participants from phase one who have indicated that they would like to participate in phase two. All information will be treated with confidentiality.

The second phase of the research will consist of 1-2 hour face-to-face in-depth interviews at a place convenient for the participant. The interviews will be conducted by myself and you will be remunerated with R200 for your participation.

Participation in this research is voluntary and you will not be advantaged or disadvantaged in any way for choosing to participate or not to participate in the study. You have the right to withdraw from the research at any time. Your details will only be available to my supervisor and myself and I assure you of complete confidentiality by assigning a code to your personal details ensuring that no details are linked to the data. I guarantee that all information will be anonymised in the report.

The identifying information that you choose to provide is only for the purposes of potentially contacting you regarding the lucky draw or inviting you to the second phase of the research (if you indicated that you would like to volunteer for the second phase). All the data will be stored securely in a password protected file on a password protected computer. Participants will remain anonymous in the final report. Should you require a summary of the study results, I will provide it upon request.

Are you willing to participate in the research? By clicking on the yes button and completing/submitting the online questionnaire you hereby provide consent to participate in my research and acknowledge that you understand the purpose and requirements for being involved in the research.

Student: Andrea Marais
071-677-0974
andrea@plunge.co.za

Supervisor: Prof. A. Thatcher
University of Witwatersrand
011-717-4533
Andrew.Thatcher@wits.ac.za

Appendix 3: Participant letter after quantitative phase



Dear Participant,

Thank you for taking part in the first phase of my PhD research which aims to understand people's beliefs, attitudes, values and behaviour towards the environment.

This first phase of the research consisted of an online questionnaire. If you indicated that you would like to participate in the second phase of my research consisting of 1-2 hour face-to-face in-depth interviews, I will be making contact with you around August this year to schedule a time convenient for you.

Just a reminder should you agree to still participate in the second phase of the research note that you will not be anonymous, as I will meet with you face-to-face and I will match your survey responses to the interview. I will however, ensure that your responses remain confidential. You will be given a random number that I will use for the analysis and the reporting and you will not be identifiable in the results. You are in no way obligated to participate in phase two (in-depth interviews), after choosing to participate in phase one or indicating that you would like to participate in phase two. For phase two I will randomly select and contact a group of participants from phase one who have indicated that they would like to participate in phase two. Therefore not everybody who indicated that they want to participate in phase two will necessarily be contacted. All information will be treated confidentially.

For the Lucky draw for phase one I used a randomization algorithm to identify the winners. Due to confidentiality I am not allowed to publish the full details of the winners.

1st Prize: Smartphone to the value of R5000 – **JS from Limpopo**
2nd Prize: R3000 Faithful to Nature online shopping voucher – **SM from Johannesburg**
3rd Prize: R2000 Faithful to Nature online shopping voucher – **LW from Johannesburg**
4th Prize: R300 Faithful to Nature online shopping voucher – **JH from Durban**
5th Prize: R200 Faithful to Nature online shopping voucher – **ZG from East London**

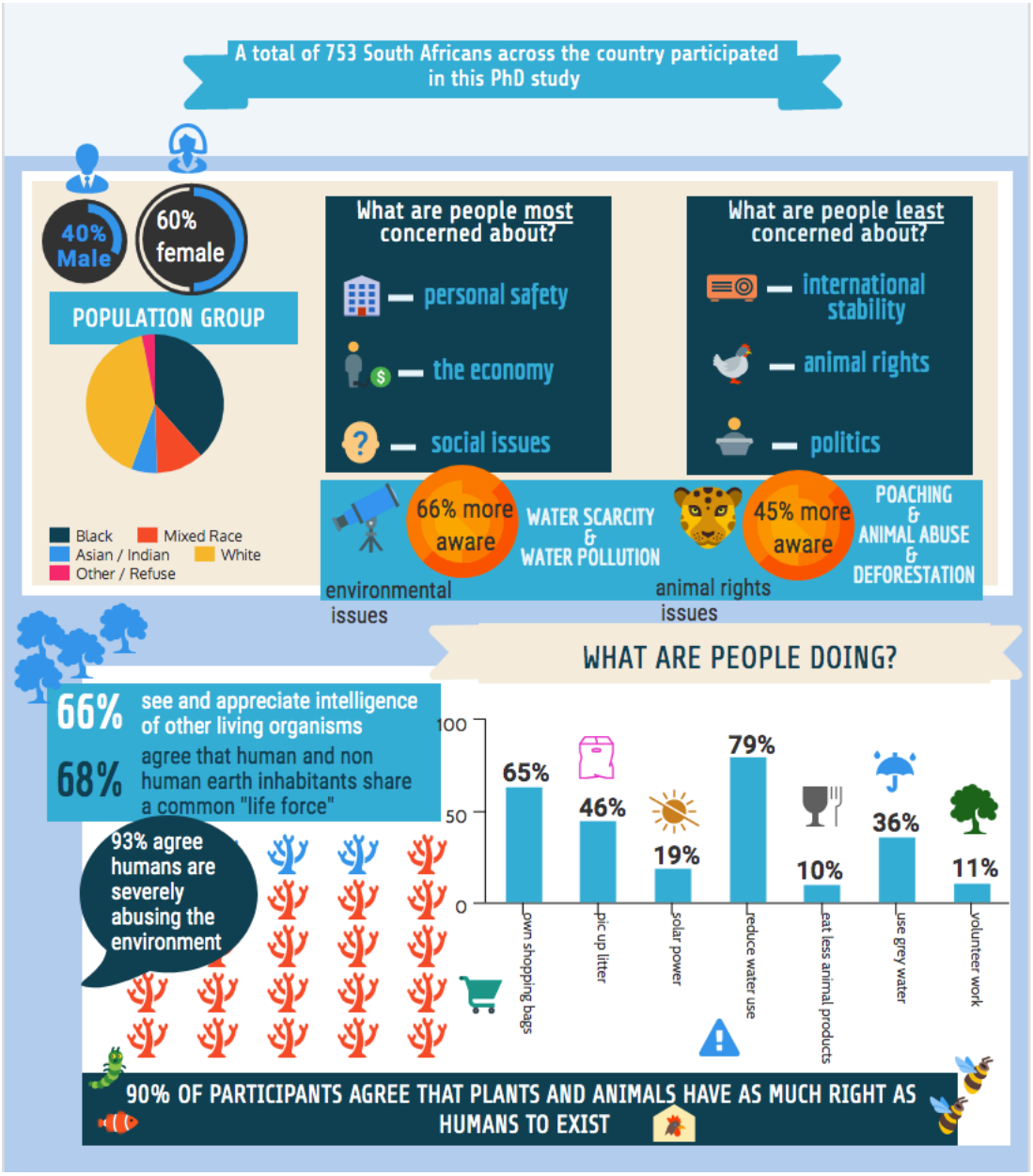
Congratulations to the winners and thank you to everybody for taking the time to participate in the first phase of my research. **I will contact the winners directly.**

If you would like to receive summarised feedback from the first phase of the research, kindly let me know.

Student: Andrea Marais
071-677-0974
andrea@plunge.co.za

Supervisor: Prof. A. Thatcher
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Appendix 4: Participant feedback



Appendix 5: Shortened typology questionnaire

1. How **concerned** are you about the following environmental issues? **(Rotate attributes)**
0 = No opinion; 1 = Not at all concerned; 2 = Slightly concerned, 3 = Somewhat concerned, 4 = Moderately concerned; 5 = Extremely concerned

(RC)Air pollution	
(RC)Water scarcity	
(RC)Natural resource depletion (e.g. forest, water, energy)	
(SC)Nuclear energy	
(RC)Water pollution	
(SC)Use of pesticides / poisons	
(SC)Genetically modified foods (GMO)	

2. To what extent do you agree or disagree with the following statements
99 = Don't know; 1 = Strongly disagree; 2 = Disagree, 3 = Neither agree or disagree 4 = Agree, 5 = Strongly agree

ENVIRONMENT	
(SR)Environmental impacts are often overstated	
(SR)Environmental issues should be dealt with primarily by future generations	
DOMESTIC ANIMALS	
(SR)Issues around the welfare of domestic animals are often overstated	
(SR)Issues around domestic animals should be dealt with primarily by future generations	
FARM ANIMALS	
(SR)Issues around the welfare of farm animals are often overstated	
(SR)Issues around farm animals should be dealt with primarily by future generations	
WILD ANIMALS	
(SR)Issues around the welfare of wild animals are often overstated	
(SR)Issues around wild animals should be dealt with primarily by future generations	
(SR)Wild animals need to contribute economically to deserve protection	
GENERAL	
(AA)I find it hard to change my habits to be more environmentally-friendly	
(AA)Environmental problems is not a priority for me	
(AA)The effects of environmental destruction, such as climate change, is too far in the future to concern me	
(AA)It takes too much effort to adopt an environmentally friendly lifestyle	

3. Please answer each of these questions in terms of the way you generally feel. There are no right or wrong answers. Using the following scale, state as honestly and candidly as you can what you generally experience. **(Rotate statements)**
1 = Strongly Disagree,2, 3, 4 = Neutral, 5, 6, 7 = Strongly Agree

I often feel a sense of oneness with the natural world around me	
I think of the natural world as a community to which I belong	
I recognise and appreciate the intelligence of other living organisms	
I often feel disconnected from nature	
When I think of my life, I imagine myself to be part of a larger cyclical process of living	
I feel as though I belong to the earth as equally as it belongs to me	
I often feel a kinship with animals and plants	
I have a deep understanding of how my actions affect the natural world	
I often feel part of the web of life	
I feel that all inhabitants of earth, human, and nonhuman, share a common 'life force'	
Like a tree can be part of a forest, I feel embedded within the broader natural world	

When I think of my place on earth, I consider myself to be a top member of a hierarchy that exists in nature	
I often feel like I am only a small part of the natural world around me, and that I am no more important than the grass on the ground or the birds in the trees	
My personal welfare is independent of the welfare of the natural world	

Appendix 6: Interview guide

1. RESEARCHER QUESTION: Tell me a bit about **yourself?**
Explore how they grew up, what do they perceive as their purpose, what are their lives like…

2. RESEARCHER QUESTION: How would you describe who you are, your **identity**?
Explore sources of perceived identity, view about their lives, personality, values, fears, future outlooks.

RESEARCHER INTRO: I would now like to explore your relationship with nature…here I have a set of different cards (NNET). These cards represent different ways in which people have described what they think, feel and believe about nature, in other words, what relationship they have with nature. I would like you to have a look at them and choose the card that you think most strongly represents what you think, feel and believe about nature, but more specifically a card that represents your own personal relationship with nature. Also choose the opposite.

3. RESEARCHER QUESTION: Tell me about the card you chose and what it says about your **relationship with nature**?
Probe the meaning nature has for them and what this says about their relationship, role of animals, emotions they might feel, role of nature, commonalities, concenrs, responsibilities, memories of nature.

4. RESEARCHER QUESTION: What does **climate change** mean to you?
Explore thoughts, perceived impacts, social awareness, perceived causes, personal responsibility, personal impacts, contributing behaviours, disasters.

Appendix 7: Development of an enabling technique

Using a deductive approach to develop an enabling technique: Exploring people's relationship to the biosphere

Abstract

Projective or enabling techniques are a popular method used for exploring subconscious processes or to engage participants in a subject that might seem abstract. However, there is a lack of information on how to develop of an enabling technique. Furthermore, there is a dearth of techniques available in the field of ecopsychology to assist practitioners in exploring biospheric relationships. The aim of this paper is to address three gaps within the field of ecopsychology. The first is how to develop an enabling technique to tacitly explore the relationship that people have with nature. The second gap is deductively identifying different types of relationships that people might have with the biosphere. Lastly, to develop a set of enabling cards that can be used to tacitly explore the relationship that people have with nature. The results show a range of cards that cover human-nature expressions that might include intimacy, empathy, engagement, ambivalence, apathy and alienation.

Introduction

Projective methods have been used in psychology following the work that Freud did on paranoia in 1911. Since then there has been the development of projective tests notably the Rorschach Ink Blot Test and the Thematic Apperception Test (TAT). The field of market research has also used projective techniques successfully based on their use in psychoanalysis (Donoghue, 2000). Dichter, 1960 (in, Will, Eadie & MacAskill, 1996) define projective and enabling techniques as visual triggers that use an indirect approach to elicit responses from participants that potentially have an unconscious source. This technique aims to access unfiltered perceptions and feelings by projecting it onto ambiguous images which enables the researcher to explore hidden meanings not accessed in everyday life (Donoghue, 2000; Porr, Mayan, Graffigna, Wall & Vieira, 2011).

Although the term projective and enabling technique is often used interchangeably, Boddy (2005) suggests that they are different. Projective techniques use somebody or something else as a point of departure and the researcher assumes that the participant is talking about himself or herself, whereas in enabling techniques, the participant responds as themselves (Boddy, 2005). Therefore, all projective techniques are enabling but not all enabling techniques are projective (Will, Eadie & MacAskill, 1996). As such, although this paper refers to the development of an enabling technique, it could also be used as a projective technique by changing the way the question is phrased to the participant.

There are different types of visual enabling techniques. According to Comi, Bischof and Epplier (2014) these are association (picture impressions), completion (picture completions and mind mapping), expression (drawing) and collection (collect pictures and comment) techniques. Although the visual technique of collection will be used during the development of the enabling technique the final technique will be a picture impression that can used with a participant during an in-depth interview.

Benefits and shortcomings of enabling techniques

Just like the Trojan horse, a psychologically constructed visual technique has the ability to use a visual in order to unearth the depth contained inside the psyche. Some other benefits are that they allow for the expression of value, provide access to sensitive topics, have the ability to explore hidden attitudes and feelings (Donoghue, 2000), allow for multiple interpretations (Basu, 2014), provide an organising framework for data analysis and shared participant expressions and experiences, allows for emotional engagement (Comi, Bischof & Epplier, 2014), has the ability to activate memory recall (Wheeldon & Faubert, 2009), been found to reduce social desirability, increase cognitive access (overcome bounded rationality) (Bond & Ramsey, 2010) and is less intrusive for participants in that they are under less pressure compared to direct questioning (Will, Eadie & MacAskill, 1996).

Although there are many benefits to using projective or enabling techniques there is one poignant shortcoming. In a critique by Lilienfeld, Wood and Garb (2000) they are said to have questionable psychometric properties. To address this issue Comi, Bischof and Epplier (2014) maintain that the data collected from projective or enabling techniques are complex and should be integrated with information gained from the interview in order to ensure accurate interpretations. It should be noted that during the development of the enabling technique each visual representation is linked to an identified category, it is not to say that that specific category will emerge in relation to the card when using the technique in field. The categories will shape and shift based on how participants interpret and explain the card chosen and as such one could find that although during the development one card emerged from an identified category, based on the explanation and interpretation from the participant, it represents a different category (identified or emerging). Although there is literature looking at the usage, benefits and shortcomings of enabling / projective techniques, there is a lack of information on how to develop one and more so on how to use them to explore people's connection to the biosphere.

Understanding people's connection to the biosphere

The emotional relationship that people have with the biosphere (Kollmuss & Agyeman, 2002) is critical in shaping beliefs, values and attitudes towards the environment and also has the ability to impact environmental behaviour (Ojala, 2012). According to a study conducted by Baillie (2003), some people are more in touch and connected with nature whereas for others this connection is latent, impacting the manner in which they behave towards the environment (Hinds & Sparks, 2009). Although there are studies that explore connection to nature (Clayton, Luebke, Saunders et al., 2013; Capaldi, Dopko & Zelenski, 2014) and psychometric measurements (Frantz, Mayer, Norton & Rock, 2005; Perkins, 2010); one existing gap is the exploration of different types of 'connection to nature' which explores particularly the different types of relationships that people have with the biosphere rather than just their attitudes. Currently there are cognitive and affective measures exploring the relationship with nature but this is done through statements and is therefore quantitative in nature. Some of the current quantitative measures are Commitment to nature (Davis et al., 2009), Connectedness to nature (Mayer & Frantz, 2004), Emotional affinity toward nature (Kals et al., 1999), Environmental identity (Clayton, Luebke, & Saunders, 2013) and Inclusion of nature in self (Schultz, 2011). Some researchers have identified different types of relationships but they are reductionistic and attitudinal, structured around prioritizing

self versus others versus the biosphere (Kortenkamp & Moore, 2001; Liu & Lin, 2013; Schultz & Zelezny, 1999).

Research aims

The overall aim is to demonstrate the development of an enabling technique using a deductive approach. Secondly, to argue for the existence of different types of relationship to nature and lastly to propose an enabling technique that can be used to explore people's relationship to the biosphere.

Process used to develop an enabling technique

Porr, Mayan, Graffigna, Wall and Vieira (2011) developed a projective technique in four phases to facilitate the design of a logo. Their first phase consisted of emotional exploration by open-ended questions with embedded images. The second phase consisted of a sentence completion task; the third was the development of themed visuals around the emergent information from the initial two phases. The final phase was collation of all the information into the construction of symbolic visuals from which a logo emerged. Westphal (2007) used a different process developing a clinical projective test to assess experience of attachment in middle childhood. The process started with pencil drawings inspired by scenes from children books and then trialed for their appropriateness and effectiveness. The data was used to build a coding framework grounded in theory. The pictures were amended based on their ability to elicit internal representations. Thereafter, the projective was piloted with a non-clinical and clinical sample for assessment (Westphal, 2007). Although the above examples draw from the field of marketing and psychology, there is a dearth of information on the process of developing a projective/enabling technique. As such, this paper aims to address this shortcoming in order to empower researchers to develop techniques that are matched to their topic of study and required outcomes.

The following sections will explore step-by-step how the enabling technique was developed. In summary, it entailed using a deductive approach that started with creating categories of types of relationship to nature using themes that emerge from existing literature. At the same time an online study gathered initial data in order to use it to validate the identified theoretical typologies. The online study provided both textual and symbolic data that was used to validate and expand the identified theoretical categories through a process of coding and categorising. Based on the confirmed set of categories aligned with the visual and textual data, sets of pictures were developed using these categorical insights. A set of pictures were developed (rather than using existing ones) in order to ensure, no copyright infringement, that they have the same feeling, colour types etc. to avoid participants choosing a picture that might be clearer or printed brighter. This way each enabling picture has the same chance of being chosen by the participant. Following the developed pictures another online study was launched in order to test the ability of each picture to be descriptive, usable, understandable and enabling. Based on these results pictures were confirmed, amended or deleted from the set.

Table 1: Summary of deductive approach to develop an enabling technique

Step 1	Create tentative categories using existing literature
Step 2	Using thematic analysis principles, create codes for each identified category
Step 3	Gather initial data from participants exploring potential category expressions (N = 43)

Step 4	Match data gathered with tentative theoretical category codes. Confirm, reduce or expand categories
Step 5	Develop set of pictures with same expression, style and colours
Step 6	Test feasibility of picture set to measure identified categories. Also evaluate the ability of each picture to be descriptive, usable, understandable and enabling (N = 5)
Step 7	Confirm, amend or delete pictures from the set
Step 8	Finalise picture set to use in main study

Step 1: Using literature to build categories

Martin (2004) proposes a pedagogical developmental model after describing how participants in his study moved through various phases during a two-year period of outdoor education. The qualitative results formed three broad 'connection to nature' categories namely: integrated with nature (nature as sacred and with spiritual value; a sense of oneness), caring for nature and then travelling through nature (nature as part of life; as a place to go) (Martin, 2004). Martin (2004) then continued to add a fourth hypothesised category namely alienated from nature (nature as unacknowledged or feared). Using the work done by Martin (2004), albeit developmental, one can build a working model of types of 'connection to nature' using his limited categories as a draft framework.

The first category identified is **intimacy** in line with Martin's (2004) integrated with nature category. There is an overlap in theory that describes the idea of intimacy and empathy in relation to the biosphere. One could argue that broadly speaking they are not mutually exclusive because they potentially contain similar constructs in that to be intimate with nature, one could assume that there is a degree of empathy present. However, the theory suggests that intimacy is characterized more by interdependent and selfless qualities versus empathy, which comes across as more dependent and non-altruistic. Herbert (2014: 30) describes the difference between empathy and intimacy by stating: "It is easiest for us to recognize consciousness in the forms of life with characteristics most familiar to us, but the reach of intersubjectivity can extend far beyond our anthropocentric perceptions of consciousness". Herbert (2014) uses a transcendental phenomenological approach to describe intersubjectivity as a lack of experienced boundary between the person and the biosphere. This fits with Martin's (2004) idea of nature as sacred and with spiritual value and aligns with Puhakka (2014:12) that describes intimacy as "that mysterious, delightful, at times dreadful interweaving of two that are of one essence" characterised by the knowledge that humans are part of an intricate system, embodied experience, recognising the sentience in animals, plants, landscapes and air (Herbert, 2014). This conscious connection to nature is characterized by appreciation, care, compassion and reverence for all sentient beings (Herbert, 2014). The idea of intimacy with nature coincides with Schultz's (2001) self-expansion theory, which states that there is an inclusion of nature in the self-concept, and also with Shamanic ideology where elements of nature is included in social identity (Winkelman, 2013). Shamanism view animals as the base from which human psychological development occur (Winkelman, 2013). Furthermore, the idea of intimacy is also expressed under the condition of subjective self-awareness (SSA) where the boundaries between self and nature are indistinct (Silvia, 2002) and where there is the presence of an ecological self (Bragg, 1996). Bragg (1996) describes the ecological self as an extended self-experience that includes emotional resonance with the biosphere. Puhakka (2014) suggests that intimacy is opened up

through sensorial experiences of nature. Based on the above literature from which the category of intimacy emerges the themes identified are: **interdependence, commitment to nature, nature as sacred with spiritual value, sense of oneness with nature and emotional closeness.**

Tam (2013) describes a concept called Dispositional Empathy with Nature (DEN) as a tendency to understand and share an emotional experience with the natural world. People with an empathic relationship to nature are likely to show compassion towards and anthropomorphise nature and animals (Tam, 2013). **Empathy (Sympathy)** with nature, the second category, influences pro-environmental behaviour (Tam, 2013) because it is characterized by a sense of concern and caring for nature (Martin, 2004; Schultz, 2001). This affinity towards nature can evoke feelings of guilt or anger towards others that pollute (Kals, Schumacher & Montada, 1999). Batson, Sager, Garst, Kang, Rubchinsky and Dawson (1997) found in their human sample that empathy is not induced by self-other merging (as in the case of intimacy) and rather explained by perspective taking that is to say to put yourself into the place of the other (Schultz, 2001). Perspective taking is associated with feelings of compassion, tenderness and sympathy but is also described as non-altruistic (Cialdini, Brown, Lewis, Luce & Neuberg, 1997). Non-altruistic in that for example being concerned about the protection and survival of nature (Kals, Schumacher & Montada, 1999) is in fact concern about ones own survival (Cialdini, Brown, Lewis, Luce & Neuberg, 1997). Based on the above literature from which the category of empathy emerges the themes identified are: **Anthropomorphising, sympathy, shared emotional experience, conservation tendencies and compassion.**

On the other hand, Kaiser and Byrka (2011) explores pro-social behaviour and is of the opinion that environmental concern could in part be due to a sense of moral obligation. This idea from Kaiser and Byrka (2011) expands across Martin's (2004) category of travelling through nature and will be called **recreational engagement** in the model. In the category of recreational engagement there exists a degree of concern that is not necessarily empathic (Tam, 2013) but concern to protect nature as it is a place to go (Martin, 2004). This relationship is categorized by having an interest in nature that motivates experiencing nature and gathering knowledge but it is not sensual (Kals, Schumacher & Montada, 1999). Another theoretically emerging category is **theological engagement** that describes man and nature as separate creations of God and is entrenched in Cartesian dualism (Capra, 1996). Hoffman and Sandelands (2005) created a concept called Theocentrism, which is an environmental expression of religion that advocates values such as humility, respect for God's creation and responsibility. This type of relationship is categorized by population growth encouragement and also to engage with nature as a creation of God (Hoffman & Sandelands, 2005). One has to respect nature because it is created by God and also one can connect with God through experiencing nature. Based on the above literature from which the category of engagement emerges the themes identified are: **Experience, sense of moral obligation, non-altruistic concern and control.**

Puhakka (2014) talks of **apathy** towards nature in which a person is conscious of what is moral and right but lacks the empathy to adjust their environmentally destructive behaviour. The ego-centric view of self-enhancement could describe this category in that people with this type of relationship to nature do not define other people or other living things within their boundary of self and therefore have less biospheric concerns (Schultz, 2001). Therefore there is disinterest, abandonment or lack of concern

seen in their emotional distance from nature (Simms, 2014). Simms (2014: 241) says: “They have no attachment to nature places and feel no immediate responsibility for the well-being of other species because nature is what is on the nature channel or in the life-sciences textbook and does not really have anything to do with their lives. Nature, for them, exists as a virtual, global, and intellectual presence, and not as an embodied, engaged and local encounter”. The idea of Nature Deficit Disorder is one that overlaps with both apathy and alienation (Louv, 2012). Based on the above literature from which the category of apathy emerges the themes identified are: **Nature as out there, individualistic, moral awareness and emotionally disconnected.**

Disconnection from nature at its most extreme could be called **alienation** or isolation (Martin, 2004) characterized by extreme dissociation (Swim et al., 2009) chronic distraction, sensory shutdown and objectification of self and other (Puhakka, 2014). According to Herbert (2014) this degree of disconnection is reflected in humans’ ways of objectifying nature, spending most of our time indoors and forming complex relationships with human-made forms. This lack of connection is linked to narcissistic traits such as exploitativeness, entitlement and objective self-awareness (OSA) (Frantz, Mayer, Norton & Rock, 2005). The self is experienced as autonomous with no emotion towards the biosphere (Silvia, 2002). The experience of the natural world is like something alien as the person is unable to understand the consequences of their actions (Stone, 2014). This type of relationship with nature has been called Nature Deficit Disorder Louv (2012). Based on the above literature from which the category of alienation emerges the themes identified are: **Anthropocentric, narcissistic, entitlement and objectification.**

Baker (2013) outlines a psychodynamic view of the environmental crisis identifying **ambivalence** as a way of understanding the way in which humans treat the earth. Ambivalence is described by Baker (2013) as the idea that the earth is experienced as generous yet vindictive. In order to deal with the anxiety experienced by this ambivalence humans split, deny, repress, project or destruct (Baker, 2013). Splitting occurs when one thing that is known in a part of the mind is unknown to the other and later the splitting progresses to a state where things that are connected are experienced as disconnected (Randall, 2005). Denial manifests in many ways, one being consumerism (Randall, 2005) in the face of depleting natural resources. Projection occurs when people attribute the problems as caused by somebody else or that somebody else will solve the problem (Randall, 2005). Destructiveness manifests in that humans treat natural resources as limitless so as to not face the fact of their own eminent death. Humans thrive on love of life but contrasted there are weapons of mass destruction and the unfolding of the anthropogenic sixth mass extinction. The defences of denial, splitting and projection are primitive ones (Randall, 2005) which supports evolutionary theory which states that the human brain has not evolved adequately biologically to adapt and deal with the challenges of the modern world (Van Vugt, Griskevicius & Schultz, 2014). Based on the above theory a category called ambivalent relationship to nature was created and described as a relationship characterized by traits such as antagonism, splitting, destructiveness, denial, repression and projection. In this context it relates to what Winnicott (1953) describes as transitional phenomena, which is an intermediary area of experiencing the objective versus the subjective. Based on the above literature from which the category of ambivalence emerges the themes identified are: **Binary antagonism, fear, denial, repression, splitting and projecting.**

Step 2: Identifying themes for each category

Based on the categories above that emerged from existing theory a coding framework was constructed through which the first level data can be compared and contrasted. The categories are Intimacy (Intm), Empathy (Empt), Recreational Engagement (REngg), Theological Engagement (TEngg), Ambivalence (Ambv), Apathy (Aph) and Alienation (Alnat). Each category has themes based on their emergence from the above data and subsequent allocated codes that will be used to categorise the visual and textual data gathered.

Table 2: Categories, themes and codes

Categories	Themes and Codes	Categories	Themes and Codes
Intimacy (Intm)	▪ Interdependence (intd) ▪ Commitment to nature (ctn) ▪ Nature as sacred and with spiritual value (nssv) ▪ Sense of oneness with nature (soo) ▪ Emotional closeness (ec)	**Ambivalence (Ambv)**	▪ Binary antagonism (bag) ▪ Fear (fr) ▪ Denial (dnl) ▪ Repression (rpss) ▪ Splitting (sptt) ▪ Projecting (proj)
Empathy (Empt)	▪ Anthropomorphise (anthmp) ▪ Sympathy (spt) ▪ Shared emotional experience (see) ▪ Conservation tendencies (ctc) ▪ Compassion (cpss)	**Apathy (Aph)**	▪ Nature as out there (not) ▪ Individualistic (indv) ▪ Moral awareness (ma) ▪ Emotionally disconnected (ed)
Engagement (REngg / TEngg)	▪ Experience of nature based on recreation (expr) ▪ Experience of nature based on theology (exprth) ▪ Sense of moral obligation (somo) ▪ Non-altruistic concern (nac) ▪ Control (cnrl)	**Alienation (Alnat)**	▪ Anthropocentric (anthct) ▪ Narcissistic (narss) ▪ Entitlement (entl) ▪ Objectification (obj)

Step 3: Gather initial data from participants exploring potential category expressions

While using content analysis to construct theoretical categories emergent from existing theory, primary data was collected using an online research tool. Survey Gizmo (https://www.surveygizmo.com) was used to collect both textual and visual data. As remuneration for time and effort participants who completed the questionnaire was entered into a lucky draw, which forms part of a larger study.

Participants were asked to complete demographic questions and then first upload a picture that describes the way they think, what they believe, how they see and feel about nature. The idea was to first get a spontaneous visually representative idea of their relationship to nature. After uploading the

picture participants were asked to describe in words their thoughts, beliefs, visuals and feelings that they associate with nature in the picture they chose to upload.

In total 43 data sets were gathered of which 34 completed both textual and visual responses, 8 provided only textual responses and 1 a visual response (excluded from analysis). 25 participants were female and 18 were male. With regards to racial spread 60% of participants were white, 26% were black, 9% were mixed race, 2% were indian and 2% refused. Most participants were from Johannesburg, Cape Town and Pretoria and surrounding areas with the majority of participants (81.4%) being Christian.

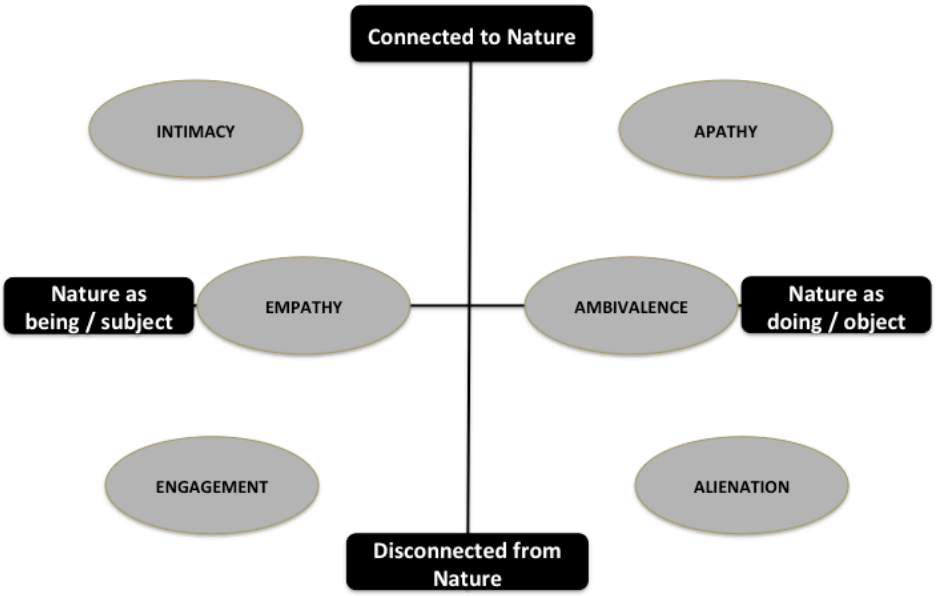
At this point categories were identified emerging from existing theory, then themes and codes were generated while gathering visual and textual data online. The next step illustrates the use of the three initial steps in confirming, reducing or expanding the identified categories.

Step 4: Match data gathered with tentative theoretical categories. Confirm, reduce or expand categories

Content analysis is used to match data with categories. Mayring (2000) describes content analysis as a procedure to fit data within an identified model using rules or codes identified. Deductive category application is applied by using theoretically derived categories and bringing them in connection with the text and visuals. All pictures and texts were analysed by looking at the emergence of the most codes in a particular category. Not all codes have to be present for a text and visual to be allocated to a particular category. Based on this the text and visual was allocated to a category.

Based on the analysis there are two overarching ideas that underpin the categorisation. These are the degree to which people are connected to nature and whether they see nature as a being / subject or doing / object. These two dimensions can be used to develop a matrix on which to plot the emerging themes above. The matrix provides a visual demonstration of what the pictures and ideas have in common and also assists in collectively suggesting a unified idea for the development of one or two cards that could represent that category. The participant pictures and plotting on the matrix are excluded as many of them shared personal identifying pictures.

Figure 1: Connectedness to nature matrix



Step 5: Develop set of pictures with same expression, style and colours

A set of connectedness to nature pictures were then developed using two inputs namely the themes from the theoretical categories and the pictures and words that emerged from the participants. Jung (1969) said that there is a light and shadow side to the persona which is a view that corresponds with most things in life such as positive and negative emotions, experiences or relationships. As such, the categories will have both a light (positive) expression as well as a shadow (negative) card expression. The aim of having two category expressions is to provide the participant with more options for self-expression.

Categories	Themes and Codes	Enabling technique structure
Intimacy (Intm)	▪ Interdependence (intd) ▪ Commitment to nature (ctn) ▪ Nature as sacred and with spiritual value (nssv) ▪ Sense of oneness with nature (soo) ▪ Emotional closeness (ec)	*Intim Light card*: Person walking barefoot and foot becomes part of nature, like a tree growing out of toes or flowers. *Intim Shadow card*: Somebody chopping down a tree and it feels like they are chopping her down. Maybe there needs to be a inter boundary picture. The tree is the person and the person is the tree being chopped down.
Empathy (Empt)	▪ Anthropomorphise (anthmp) ▪ Sympathy (spt) ▪ Shared emotional experience (see) ▪ Conservation tendencies (ctc) ▪ Compassion (cpss)	*Empt Shadow card*: A mountain with flowers but the flowers are made from litter, the grass from straws and other rubble. So a nature that made from litter. *Empt Light card*: Two hands together than form the earth but a bit more detailed showing nature scenes and humans too.

Engagement (REngg / TEngg)	▪ Experience of nature based on recreation (expr) ▪ Experience of nature based on theology (exprth) ▪ Sense of moral obligation (somo) ▪ Non-altruistic concern (nac) ▪ Control (cnrl)	*TEngg Shadow card:* God standing on a pulpit looking powerful and in control of nature and people. He is pressing down on nature. Aloof. Or maybe God that is holding a snow globe and inside is nature and humans and he is shaking it. *TEngg Light card:* A tree that looks like God and a person speaking to the tree? Nature as a reflection of God. *REngg Light card:* A bunch of perfumes and each are labelled bushveld, sicklebush, sunflower in bloom, etc. sound of an owl or a cricket or the night. *REngg Shadow card*: A person sitting at a desk looking at nature pictures. A cup with a flower on it. A mousepad with an elephant. The only way they connect with nature is through technology. Person looks like a zombie because they enver get out.
Ambivalence (Ambv)	▪ Binary antagonism (bag) ▪ Fear (fr) ▪ Denial (dnl) ▪ Repression (rpss) ▪ Splitting (sptt) ▪ Projecting (proj)	*Ambv Light card:* Chess match with nature characters on the one side and humans on the other side of the board. *Ambv Shadow card:* A Tsunami and people drowing etc. Nature at war. Sharks eating people etc.
Apathy (Aph)	▪ Nature as out there (not) ▪ Individualistic (indv) ▪ Moral awareness (ma) ▪ Emotionally disconnected (ed)	*Aph Light card:* Person looking through a window. Nature on the other side. You need to see that there is distance between the person and the natural scene. They are disconnected although the person is aware. *Aph Shadow card:* A woman looking in mirror and putting on make up but the make-up is made of dead Tigers, the eye shadow dead geese etc. It shows her disconnectedness because she is only worried about herself and her own beauty.
Alienation (Alnat)	▪ Anthropocentric (anthct) ▪ Narcissistic (narss) ▪ Entitlement (entl) ▪ Objectification (obj)	*Alnat Shadow card:* Showing a production line so maye planting a tree, watering a tree, then cutting down a tree to make a house or paper for books. Like a factory farm of natural resources.

		Alnat Light card: A woman who is pregnant and also holding up a baby. Showing anthropocentric attitude that it is just about humans. No nature.

Step 6: Test feasibility of picture set to measure identified categories

The feasibility of the initial picture set was tested for their ability to be descriptive, usable, understandable and enabling by 5 psychologists working in the field of environmental and ecopsychology.

POSITION 1	Psychotherapist & Ecopsychologist (Uruguay)
POSITION 2	Research Psychologist, PhD (SA)
POSITION 3	Ecopsychologist (Italy)
POSITION 4	Associate Professor Environmental Psychology (SA)
POSITION 5	Clinical Psychologist (SA)

Step 7: Confirm, amend or delete pictures from the set

The feedback was the specialists was incorporated and pictures were confirmed, amended, or deleted from the set.

Step 8: Finalise picture set to use in main study

The final set of pictures formed part of the qualitative phase of the larger study. The categories of connection to nature identified for the purposes of the fieldwork were not absolute.

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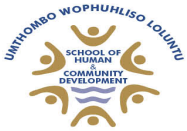
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Appendix 8: Qualitative consent forms



THE SCHOOL OF HUMAN AND COMMUNITY DEVELOPMENT
(SHCD)



Qualitative Consent Forms

1. Consent form – Qualitative Interview

I _____(name and surname of participant) volunteer to be part of the qualitative phase of the study that consists of an in-depth interview taking between 1-2 hours.

I, the participant, understand that:

- My participation is voluntary and that I was contacted because I chose to be included in the interview stage of the research, after completing the online questionnaire
- No information that may identify me will be included in the research report, and my responses will remain confidential
- That I have the right to withdraw from the research at any time
- That I do not have to answer any questions or provide any information that makes me uncomfortable
- That I have the right to request the transcript of the interview

I hereby consent to the following:

- To be interviewed by the researcher
- That direct quotes can be used anonymously for reporting

_____(Signature)

Participant Name and surname

2. Consent form – Qualitative Interview recording

I _____(name and surname of participant) volunteer to be part of the qualitative phase of the study that consists of an in-depth interview taking between 1-2 hours.

I, the participant, hereby consent to the following:

- That the interview can be audio recorded and transcribed for analysis purposes
- That direct quotes can be used anonymously from the recording for reporting

I understand that the recording and transcription will not be used for any other purposes other than reporting and that all data will be treated confidentially.

_____(Signature)

Participant Name and surname

Appendix 9: Transcription agreement

Transcription Agreement

I _____herewith acknowledge that I am personally working on the transcription and agree to treat all the information from the interview recordings with confidentiality and not to disclose any of the information or participant details to anybody. Additionally, once the transcription has been completed, I will permanently delete the audio and transcript file from all the devices.

Name _____

Signature _____

Appendix 10: Member checking e-mail to participants

Member checking e-mail to participants

Dear XXX

You participated in my PhD (at University of the Witwatersrand) research during 2016. My research aims to understand the different types of relationships people have with the natural environment. You completed an online questionnaire after which we met for an in-depth interview.

I am approaching the end of my analysis of which part is to go back to some of the people who participated to get their input on my general theory formed. Don't worry about trying to remember the questions.

If you could e-mail me back to what degree you feel the statement generally describes you and also any further comments you might have that would be much appreciated. No response to this e-mail will be taken as agreement with the statement.

I would appreciate your feedback by the 23rd of November, 2018.

Question:

To what extent do you feel the below statement generally describes you and the way you see the world and nature? Please explain why you say so and any changes you would suggest I make to better describe how you see yourself.

Typology 1

In my life I have experienced situations in which I have felt somewhat rejected. These experiences have made me feel a bit overwhelmed and like it is me against the world. I often feel like I just need to focus on myself and on how to survive while trying to be successful and feel safe. Surviving means putting myself first before the needs of nature, animals and issues such as climate change. My religion remains important to me to get me through difficult times and also provides guidance as to the role of nature and animals in the world.

Typology 2

I often feel like I am watching the world through a window noticing and contemplating everything that is happening. I prefer to focus on the people closest to me although I am also concerned about issues humans face. I am able to deal with any challenges in my own life through remaining optimistic. I think that education/knowledge is very important and that it is something that will help nature. When it comes to issues around nature I think that it will take many people to collectively do something to make a difference. I believe that climate change is in part a natural occurrence and that humans will be able to adapt to it.

Typology 3

I often feel misunderstood by others because I dance to rhythm of my own drum. I sometimes feel, because of some the experiences I have had and things which I have seen, that the world is a bad place and that humans can also be bad. At times I feel like I am better connected to animals than to humans. Because I feel a sense of connectedness to animals I feel overwhelmed thinking about what climate change might mean for nature and animals. I probably don't spend enough time in nature but still feel somewhat connected to nature. Nature is independent but no longer pure because of how unsustainably humans live. I think the one thing we can all do is to try and reduce the amount of harm we cause to nature and animals.

Typology 4

I often see myself as a hero because I tend to focus on helping others. I focus on achieving in my life and also want to leave a legacy behind. Some might even see me as a nurturer or peace-keeper. I like to nurture people with food and I believe that nature provides for us and assists me to connect with others. I have had times where I felt a bit disappointed in nature and also think that nature can be fragile. I think that climate change impacts me although I am not a large part of the problem.

Typology 5

I would describe myself as an explorer because I am open to the world and new experiences. Others see me as non-judgmental and as somebody who is curious about the world, issues and experiences. I value relationships with humans and/or non-humans. I value nature and feel that nature should be explored. I really want to make a difference in some way whether it is in the lives of humans, animals or nature.

To some extent I feel like climate change is changing the relationship that people have with nature and that humans will need to adapt to the new type of world we will be living in.

Typology 6

I see myself as somebody who seeks pleasure. To some degree I think I am somebody who does not conform to mainstream ideas in society because I think and live differently. I value myself and would describe myself as somewhat ambitious. Sometimes I feel like I struggle to connect with other people whether it is a family member or somebody else. Therefore I find it easier to communicate with others through creativity or through technology (like social media). I find the outside world a bit unpredictable and as such I can easily disconnect myself emotionally from others. I don't think I have a particularly close relationship with nature because nature is in the distance and my focus is more on people or my own life. When it comes to climate change I find it confusing but think it might not be such as bad thing.

Appendix 11: Auditer confirmatory letter

Grounded Theory Auditing Report **Date Completed: 18 Dec 2018**

Title: Developing typologies to use as an ecopsychological framework for understanding the relationship that people have with the biosphere in South Africa.

Researcher: Andrea Marais-Potgieter, Supervisor: Prof. A. Thatcher, Auditor: Ryan Klette

Auditing process used

The purpose of the audit is twofold: to examine the process and the product of the inquiry. The former addresses the dependability of the study, and the latter addresses the confirmability of the study. The purpose of this audit was to evaluate the accuracy of the study and evaluate whether or not the findings, interpretations and conclusions were supported by the data. The auditor worked through each typology set to ensure that the findings were reflected in the data. Overall, the auditing process was consultative and involved discussions and clarifications between the researcher and auditor. It should be noted that the audit focused on the qualitative aspect of the research.

Feedback and recommendations

The following was addressed as part of the auditing process with feedback below each point:

Audit process	Audit feedback
1. Assess whether or not the research process is clearly documented.	Method section clearly documents process followed. Analysis reflects and follows through on methods used.
2. Rationales for research decisions are clearly presented.	Clearly presented and further clarified in discussions.
3. Subjective and intuitive processes have been recorded.	Researcher kept a reflexivity journal to record subjective and intuitive thoughts.
4. Analysis accurately represent participants' realities.	Researcher invited participants to comment on the accuracy of her representations.
5. Analytic structures are grounded in the data and linked to the final product, and conclusions and interpretations are supported by the data and warranted, based on the documentation provided.	Triangulation achieved. Audit confirmed that analysis is reflected in the data.

Recommendations

- Thicker descriptions for categories and properties.
- In addition to the above, check that categories are generalisable. In some instances, categories are too narrowly defined.
- For theoretical statements and further write ups, make primary name holder used for each typology more clear. This will allow for easier comparison between typologies and make it possible for the reader to quickly identify the typology under discussion.
- Think further about how to incorporate the phenomenon of outliers.

Auditor credentials

Ryan Klette: MA Social Psychology, WITS. Bcom Economics, UNISA.

Confidentiality

I agree that all data that I have been exposed to during this audit will be kept confidential.

Name Ryan G. Klette

Date: 20- Dec- 2018

Signed .....

Appendix 12: Survey battery

Survey Battery

INTRODUCTION – FIRST PAGES OF QUESTIONNAIRE INSERT FROM SEPARATE DOCUMENT

DEMOGRAPHICS

1.A **CONTACT DETAILS**

Would you like to provide your personal contact details to be entered into the lucky draw?

Yes	1	**CONTINUE (to personal details page Q 1B)**
No	2	**CONTINUE (skip personal details and go to Country Q2)**

1.B **PERSONAL CONTACT DETAILS**

FOR SOCIAL MEDIA DEPLOYMENT: If you would like to complete the survey in more than one sitting, kindly provide your e-mail address so that we can send you a link to your questionnaire so that you can continue at the point where you left off (Moved to contact details)

Name	1	**CAPTURE**
Surname	2	**CAPTURE**
Mobile Phone Number	3	**CAPTURE**
Alternative phone Number	4	**CAPTURE**
Email address	5	**CAPTURE**

2. **COUNTRY:** Are you South African and currently living in South Africa? **SINGLE RESPONSE**

Yes	1	**CONTINUE**
No	2	**CLOSE**

Close: "Unfortunately the study is currently being conducted in South Africa only"

3. **CITY:** Where in South Africa are you currently living? **SINGLE RESPONSE**

Johannesburg	1	**CONTINUE**
Pretoria	2	**CONTINUE**
Cape Town	3	**CONTINUE**
Durban	4	**CONTINUE**
Bloemfontein	5	**CONTINUE**
Port Elizabeth	6	**CONTINUE**
East London	7	**CONTINUE**
Other (specify)	8	**CONTINUE**

Which suburb do you currently live in? _____REMOVE THIS FOR NOW

4. **AGE:** What is your date of birth? **(Use DOB in order to get exact age for analysis)**

Less than 18 years	0	**CLOSE ("Thank you for your participation")**
Above 18 years	1	**CONTINUE**

5. **GENDER:** Are you..? **SINGLE RESPONSE**

Male	1
Female	2

6. **POPULATION GROUP:** How would you describe the population group to which you belong? **SINGLE RESPONSE**

Black	1
Mixed race /	2

Asian / Indian	3
White	4
Other	5
Refuse	6

7. **RELIGION:** With which religious group do you identify? **SINGLE RESPONSE**

Buddhism	1
Christian	2
Hinduism	3
Islam	4
Judaism	5
Other	6
None (skip 7.1)	7

7.1. **RELIGION:** How religious are you, if at all? **SINGLE RESPONSE**
0 = not at all 1,2,3,4,5,6,7 = very religious

8. **HOME LANGUAGE:** Which language do you speak most often at home?
SINGLE RESPONSE

Afrikaans	1
English	2
Ndebele	3
Northern Sotho	4
Sotho	5
Swazi	6
Tsonga	7
Tswana	8
Venda	9
Xhosa	10
Zulu	11
Other	12

9. **ENGLISH COMPETENCY:** How would you rate your ability to read, speak and understand the English Language?

I do not understand English	1	**CLOSE ("Thank you for your participation")**
I struggle with English	2	
I am fairly competent in English	3	
I am mostly competent in English	4	**CONTINUE**
I am completely fluent in English	5	**CONTINUE**

10. **GROWING UP LIVING:** While you were growing up (birth to age 15), who were the people who lived in your home for at least two years? Indicate the number of people in each category. **MULTIPLE RESPONSE**

Parents	
Sisters and brothers	
Grandparents	
Aunt / Uncle	
Other relatives	
Persons who are not relatives	

10.1 **GROWING UP LIVING:** Which of the following explains best where you grew up?

Large city (500 000+ inhabitants)	1
Small city / Town	2
Rural area	3
Farm	4

11. **EDUCATION LEVEL**: What is the highest level of education for each of the following?

	Yourself	Mother	Father
Some high school, but did not complete Matric	1	1	1
Matric	2	2	2
Tertiary education (Certificate / Diploma)	3	3	3
University Undergraduate Degree	4	4	4
University Postgraduate Degree (e.g. Masters or PhD)	5	5	5
Other	6	6	6
Unsure	7	7	7
Not Applicable	8	8	8

12. **OCCUPATION STATUS**: Which of the following best describes your current employment status? **SINGLE RESPONSE**

High School student	1
College / University student	2
Full time employed	3
Part time employed (not a student)	4
Part time employed (a student)	5
Unemployed	6
Stay-at-home parent (not working and not looking for work)	7
In employment but not currently working (e.g. sick leave,	8
Volunteer work only	9
Retired	10
Other (specify)	11

13. **OCCUPATION TYPE**: How would you describe your current occupation? **SINGLE RESPONSE (Routed only for those who have indicated occupation in Q12. Above, nr. 3,4,5,8)**

Professional e.g. medical doctor, lawyer, teacher	1
Middle / senior executive	2
Self-employed in commerce, industry, agriculture	3
Salaried office employee	4
Manual worker e.g. manufacturing, agriculture, etc.	5
Other (specify)	6

14.**PERSONAL INCOME**: In which income category do you fall with regards to your MONTHLY personal income, before tax and other deductions? **SINGLE RESPONSE.**

R1 - R4 999	1
R5 000 - R9 999	2
R10 000 - R19 999	3
R20 000 - R29 999	4
R30 000 - R39 999	5
R40 000 - R49 999	6
R50 000 - R59 999	7
R60 000 - R69 999	8
R70 000 or more	9
No income	10
I do not know	11
I refuse to say	12

15. **HOUSEHOLD TYPE:** How would you describe where you live? **SINGLE RESPONSE**

A detached house	1
A semi-detached house	2
A complex	3
An apartment in a building / flat	4
A shack	5
Other (specify)	6

16. **HOUSEHOLD AREA:** How would you describe the area where you currently live? **SINGLE RESPONSE**

Urban, in the city	1
Suburban, outskirts of the city/town	2
Suburban, informal settlement / township	3
Rural, farmland	4
Rural, informal settlement	5
Isolated dwelling, not in a town or village	6
Other (specify)	7

17. **RELATIONSHIP AND LIVING STATUS:** What is your current relationship status? **SINGLE RESPONSE**

Single, living in my parents' / or other relevatives home	1
Single, sharing with non-family members	2
Single, living alone	3
Unmarried, living with partner	4
Married, living together	5
Separated	6
Divorced	7
Widowed	8

17.1 **LIVING STATUS**: How many people currently live in your household?
18. **CHILDREN**: How many children, that are dependent on you, are living in the household with you? **SINGLE RESPONSE.**

None	0	**SKIP TO Q18**
One	1	**CONTINUE**
Two	2	
Three	3	
Four or more	4	

19. **AGE OF CHILDREN**: How old are these children? **MULTIPLE RESPONSE BASED ON SELECTION IN Q18**

0-5 years	1
5-7 years	2
8-12 years	3
13-17 years	4
18 -21 years	5
Older than 21 years	6

20. **PURCHASING**: Thinking about purchasing responsibility for the household (electricity bills, grocery shopping, etc.). Would you say that: **SINGLE RESPONSE.**

You have primary responsibility for these decisions	1	**CONTINUE**
You share responsibilities for these decisions	2	**CONTINUE**
You have no responsibility for these decisions	3	**CONTINUE**

ROTATE THE NEXT SECTIONS TO ADDRESS RESPONDENT FATIQUE
ENVIRONMENTAL ISSUES AND ATTITUDES QUESTIONNAIRE (EIAQ)

This section aims to understand some of the things you feel are important or less important in your life. Please remember to be as honest as possible, there is no wrong or right answer. All the answers should reflect how you feel personally.

1. **GENERAL ISSUES**

1.1 Please rank the **three issues** which are of **most importance** to you, in order of importance.

Need to make sure that on screen all the issues are showing at the same time and not popping up one at a time for this question.

International tensions (e.g. terrorism, war)	
Economic concerns (e.g. unemployment, cost of goods, value of	
Political concerns (e.g. government inadequacy, genocide,	
Environmental concerns (e.g. loss of biodiversity, global warming)	
Health concerns (e.g. cancer, AIDS, TB)	
Social issues (e.g. poverty, discrimination, education, abuse)	
Personal safety (e.g. crime, theft, lack of freedom)	
Religious concerns (e.g. sinning, offending, relationship with higher power)	
Animal rights concerns (e.g. sentience of animals, cruelty, laws that protect animals)	

1.2 Please rank the **two issues** which are of **least importance** to you.

International tensions (e.g. terrorism, war)	
Economic concerns (e.g. unemployment, cost of goods, value of	
Political concerns (e.g. government inadequacy, genocide,	
Environmental concerns (e.g. loss of biodiversity, global warming)	
Health concerns (e.g. cancer, AIDS, TB)	
Social issues (e.g. poverty, discrimination, education, abuse)	
Personal safety (e.g. crime, theft, lack of freedom)	
Religious concerns (e.g. sinning, offending, relationship with higher power)	
Animal rights concerns (e.g. sentience of animals, cruelty, laws that protect animals)	

2. **ENVIRONMENTAL CONCERNS**

a. Overall, how would you describe your **level of awareness** about environmental problems during the past two years?

0 = I don't know; 1 = I am now less aware than before; 2 = My awareness is the same as before; 3 = I am more aware than before

b. How **concerned** are you about the following environmental issues? **(Rotate attributes)**

0 = No opinion; 1 = Not at all concerned; 2 = Slightly concerned, 3 = Somewhat concerned, 4 = Moderately concerned; 5 = Extremely concerned

Air pollution	
Water scarcity	
Climate change (defined as not only global changes in temp. but also changes in wind, precipitation, the length of seasons, frequency of extreme weather events like droughts and floods)	
Rising sea levels	
Global warming (the current increase in the Earth's average	
Natural disasters (e.g. earthquake, hurricane, flood)	
Natural resource depletion (e.g. forest, water, energy)	
Ocean acidification (fundamental changes in seawater chemistry due to increased absorption of carbon dioxide negatively impacting marine ecosystems)	
Noise pollution	
Ozone layer depletion (wearing out of the amount of ozone in the stratosphere which leads to an increase in UV levels reaching the	
Human overpopulation	
Loss of natural or nature-like areas e.g. Parks, open fields	
Nuclear energy	
Waste generation	
Water pollution	
Urbanisation (e.g. loss of natural world due to development, increase in people living in cities compared to rural areas)	
Use of pesticides / poisons	
Genetically modified foods (GMO)	
Over consumption (e.g. eating too much, using too many	
Biodiversity loss (i.e. loss of biodiversity means loss of species of living things through development, pollution or natural processes)	

2.1 **ENVIRONMENTAL CONCERNS ACCOUNTABILITY**

Out of these issues you have rated that you are concerned about, which do you feel you have control over i.e. you can make a difference or can have an impact on? **ROUTE ONLY THOSE ISSUES RATED 3 OR 4 IN ABOVE Q2.**

0 = I don't know; 1 = I have no control over this; 2 = I can maybe change something small or help in a small way, 3 = What I do could have a direct impact

3. **ANIMAL CONCERNS**

a. Overall, how would you describe your **level of awareness** about animals rights issues during the past two years?

0 = I don't know; 1 = I am now less aware than before; 2 = My awareness is the same as before; 3 = I am more aware than before

b. How **concerned** are you about the following issues pertaining to animals? **(Rotate attributes)**

0 = No opinion; 1 = Not at all concerned; 2 = Slightly concerned, 3 = Somewhat concerned, 4 = Moderately concerned; 5 = Extremely concerned

Animals used in entertainment (e.g. circus, aquarium)	
Canned lion hunting (i.e. lions bred in captivity and then kept in a confined area to increase the likelihood of the hunter obtaining a	
The legal rights and protection of animals (i.e. laws that protect	
Domestic animal breeding (i.e. people breeding dogs, cats, rabbits etc. for monetary gain)	
Wild animal breeding programmes (i.e. unnatural breeding of wild animals using methods such as artificial insemination)	
Deforestation (e.g. wild animals killed to make space in areas such as forests for farming)	
Over-fishing	
Whale hunting (hunting whales for meat, oil and blubber)	
Dolphin capturing (e.g. taking them from the wild into captivity)	
Animal cruelty / abuse	
Factory farming (rearing livestock using highly intensive methods and keeping animals in confined spaces)	
Domestic animal welfare (condition and care of domestic animals)	
Farm animal welfare (how animals are looked after, transported, sold, slaughtered or exported)	
Poaching	
Trophy hunting (hunting a wild animal and keeping a part of the animal for display)	
Animals used for testing/experimentation (e.g. vivisection, medical research)	
Animals used for consumer products (e.g. fur, leather, wool, lactose, down feathers)	
Other (please specify)	

3.1 **ANIMAL CONCERNS ACCOUNTABILITY**

Out of these issues you have rated that you are concerned about, which do you feel you have control over i.e. you can make a difference or have an impact? **ROUTE ONLY THOSE ISSUES RATED 3 OR 4 IN ABOVE Q.**

0 = I don't know; 1 = I have no control over this; 2 = I can maybe change something small or help in a small way, 3 = What I do could have a direct impact

4. **ATTITUDES (Rotate sections)**

To what extent do you agree or disagree with the following statements
99 = Don't know; 1 = Strongly disagree; 2 = Disagree, 3 = Neither agree or disagree 4 = Agree, 5 = Strongly agree

ENVIRONMENT	
Each individual/household can contribute to a better environment	
Environmental impacts are often overstated	
Environmental issues should be dealt with primarily by future generations	
Environmental issues will be resolved primarily through technological	
The government is responsible for the welfare of the environment	
We must sacrifice ecomomic growth in order to preserve and protect the environment	
We must be prepared to sacrifice environmental quality for economic growth	
DOMESTIC ANIMALS	
Each individual/household can contribute to domestic animal welfare and	
Issues around the welfare of domestic animals are often overstated	
Issues around domestic animals should be dealt with primarily by future	
Domestic animal issues will be resolved primarily through technological	
The government is responsible for the welfare of domestic animals	
Domestic animals are a key source of economic growth and job creation	
FARM ANIMALS	
Each individual/household can contribute to farm animal welfare and	
Issues around the welfare of farm animals are often overstated	
Issues around farm animals should be dealt with primarily by future	
Farm animal issues will be resolved primarily through technological progress	
The government is responsible for the welfare of farm animals	
Farm animals are a key source of economic growth and job creation	
WILD ANIMALS	
Each individual/household can contribute to wild animal welfare and	
Issues around the welfare of wild animals are often overstated	
Issues around wild animals should be dealt with primarily by future	
Wild animal issues will be resolved primarily through technological progress	
The government is responsible for the welfare of animals in the wild	
Wild animals need to contribute economically to deserve protection	
GENERAL	
I find it hard to change my habits to be more environmentally-friendly	
My behaviour and lifestyle contributes to environmental destruction	
Environmental problems is not a priority for me	
The effects of environmental destruction, such as climate change, is too far in the future to concern me	
It takes too much effort to adopt an environmentally friendly lifestyle	

BEHAVIOURAL QUESTIONNAIRE (BQ)

This section aims to explore some of your own behaviours. Please remember to be as honest as you can when responding to the questions as there are no right or wrong answers. The information that you are contributing is of great importance and value.
To what extent do you (or your household) participate in the following behaviours? **(Rotate sections)**
99 = Don't know/NA; 1 = Never do it; 2 = Rarely do it; 3 = Sometimes do it, 4 = Often do it, 5 = Always do it

WASTE	
Recycle glass bottles/containers	

Recycle plastic bottles/containers	
Recycle aluminium, tin and steel cans	
Recycle paper/cardboard	
Recycle food waste (e.g. compost)	
Recycle batteries	
Recycle pharmaceuticals/medicines	
Re-use glass bottles/containers	
Re-use plastic bottles/containers	
Re-use aluminium, tin and steel cans	
Re-use paper/cardboard	
Pick up litter e.g. in public places	
Use own bags/reusable bags/containers for shopping	
Waste food / let food go off	
TRANSPORT	
Car pool/share	
Use public transport	
Reduce air travel for only neccesities	
Use recycled tires/low rolling resistance tires	
Offset carbon emissions (e.g. planting trees)	
Find ways to reduce fuel consumption	
Walk or cycle instead of using a car/taxi/bus	
Adapt driving style to use less fuel	
ENERGY	
Switch off lights when not needed	
Reduce swimming pool pump usage	
Use energy-saving lightbulbs	
Use stove and other electric appliances less	
Make use of solar power	
Reduce use of high consumption appliances such as dishwashers, clothing dryers	
Cut down on heating/air conditioning	
Wait until you have full loads when using washing machines or dishwasher	
Turn off appliances when not in use	
Switch off standby mode of appliances/electronic devices	
PURCHASE AND CONSUMPTION	
Purchase products that generate the least amount of waste	
Eat animal derived foods (e.g. milk, meat, cheese, eggs)	
Purchase organic products (no synthetic pesticides or chemical fertilizers used)	
Buy fair trade/sustainable products (products that are ethically sourced and manufactured)	
Buy fish that are not endangered (i.e. Look for the SASSI symbol)	
Purchase and consume free range meat, eggs, dairy	
Carbon count products that are purchased (consider the amount of resources / carbon used for the product)	
Boycott companies who are bad for the environment or animals	
Buy foods produced locally (i.e. in South Africa or in your city/neighbourhood)	

Use products that are less destructive for the environment (e.g. biodegrable cleaning products, biofriendly fuel, re-usable nappies, mooncups instead of tampons)	
WATER	
Bath less, shower more	
Shorter showers	
Turn off water while brushing teeth	
Reduce general water use	
Capture rain water for use	
Use grey water for the garden / recycle waste water	
Plug the sink when washing the dishes	
Water garden in the coolest part of the day to reduce evaporation	
Use water efficient toilets	
Use water efficient appliances (e.g. washing machine)	
GENERAL	
Contribute money to an environmental, conservation, or wildlife protection group	
Contribute money to a domestic or farm animal welfare group	
Do volunteer work for an environmental, conservation or wildlife protection group	
Do volunteer work for a domestic or farm animal welfare group	
I encourage wildlife in my garden (e.g. through feeding areas,	
I grow my own vegetables and fruits	

CONNECTION TO NATURE (CNS)

Please answer each of these questions in terms of the way you generally feel. There are no right or wrong answers. Using the following scale, state as honestly and candidly as you can what you generally experience. **(Rotate statements)**

1 = Strongly Disagree,2, 3, 4 = Neutral, 5, 6, 7 = Strongly Agree

I often feel a sense of oneness with the natural world around me	
I think of the natural world as a community to which I belong	
I recognise and appreciate the intelligence of other living	
I often feel disconnected from nature	
When I think of my life, I imagine myself to be part of a larger cyclical process of living	
I feel as though I belong to the earth as equally as it belongs to me	
I often feel a kinship with animals and plants	
I have a deep understanding of how my actions affect the natural	
I often feel part of the web of life	
I feel that all inhabitants of earth, human, and nonhuman, share a common 'life force'	
Like a tree can be part of a forest, I feel embedded within the broader natural world	
When I think of my place on earth, I consider myself to be a top member of a hierarchy that exists in nature	
I often feel like I am only a small part of the natural world around me, and that I am no more important than the grass on the ground or the birds in the trees	
My personal welfare is independent of the welfare of the natural	

NEW ECOLOGICAL PARADIGM SCALE (NEP)

Listed below are statements about the relationship between humans and the environment. For each one, please indicate your extent of agreement or disagreement with the statement: **(Rotate statements)**

1=Strongly disagree, 2=Mildly Disagree, 3=Unsure, 4 = Mildly Agree, 5=Strongly agree

We are approaching the limit of the number of people the earth can support	
Humans have the right to modify the natural environment to suit their needs	
When humans interfere with nature it often produces disastrous consequences	
Human ingenuity will ensure that we do NOT make the Earth	
Humans are severely abusing the environment	
The earth has plenty of natural resources if we just learn how to develop them	
Plants and animals have as much right as humans to exist	
The balance of nature is strong enough to cope with the impacts of modern industrial nations	
Despite our special abilities, humans are still subject to the laws of nature	
The so-called “ecological crisis” facing humankind has been greatly exaggerated	
The earth is like a spaceship with very limited room and resources	
Humans were meant to rule over the rest of nature	
The balance of nature is very delicate and easily upset	
Humans will eventually learn enough about how nature works to be able to control it	
If things continue on their present course, we will soon experience a major ecological catastrophe	

SCHWARTZ VALUE SURVEY (SVS)

In this questionnaire you are to ask yourself: "What values are important to ME as guiding principles in MY life, and what values are less important to me?"

There are two lists of values. These values come from different cultures. In the parentheses (brackets) following each value is an explanation that may help you to understand its meaning.

Your task is to rate how important each value is for you as a guiding principle in your life. Use the rating scale below:

0--means the value is not at all important, it is not relevant as a guiding principle for you.

3--means the value is important.

6--means the value is very important.

The higher the number (0, 1, 2, 3, 4, 5, 6), the more important the value is as a guiding principle in YOUR life.

-1 is for rating any values opposed (against) to the principles that guide you.

7 is for rating a value of supreme importance as a guiding principle in your life;

ordinarily there are no more than two such values.

In the dropdown list choose the value (-1,0,1,2,3,4,5,6,7) that indicates the importance of that value for you, personally. Try to distinguish as much as possible between the values by using all the numbers. You will, of course, need to use numbers more than once.

Before you begin, read the values in the below list, choose the one that is most important to you and rate its importance.

Next, choose the value that is most opposed to your values and rate it -1. If there is no such value, choose the value least important to you and rate it 0 or 1, according to its importance. Then rate the rest of the values in list.

VALUES LIST ONE	
EQUALITY (equal opportunity for all)	
INNER HARMONY (at peace with myself)	
SOCIAL POWER (control over others, dominance)	
PLEASURE (gratification of desires)	
FREEDOM (freedom of action and thought)	
A SPIRITUAL LIFE (emphasis on spiritual not material matters)	
SENSE OF BELONGING (feeling that others care about me)	
SOCIAL ORDER (stability of society)	
AN EXCITING LIFE (stimulating experiences)	
MEANING IN LIFE (a purpose in life)	
POLITENESS (courtesy, good manners)	
WEALTH (material possessions, money)	
NATIONAL SECURITY (protection of my nation from enemies)	
SELF RESPECT (belief in one's own worth)	
RECIPROCATION OF FAVORS (avoidance of indebtedness)	
CREATIVITY (uniqueness, imagination)	
A WORLD AT PEACE (free of war and conflict)	
RESPECT FOR TRADITION (preservation of time-honored	
MATURE LOVE (deep emotional & spiritual intimacy)	
SELF-DISCIPLINE (self-restraint, resistance to temptation)	
PRIVACY (the right to have a private sphere)	
FAMILY SECURITY (safety for loved ones)	
SOCIAL RECOGNITION (respect, approval by others)	
UNITY WITH NATURE (fitting into nature)	
A VARIED LIFE (filled with challenge, novelty and change)	
WISDOM (a mature understanding of life)	
AUTHORITY (the right to lead or command)	
TRUE FRIENDSHIP (close, supportive friends)	
A WORLD OF BEAUTY (beauty of nature and the arts)	

SOCIAL JUSTICE (correcting injustice, care for the weak)	

Now rate how important each of the following values is for you as a guiding principle in YOUR life. These values are phrased as ways of acting that may be more or less important for you. Once again, try to distinguish as much as possible between the values by using all the numbers.

Before you begin, read the values in the below list, choose the one that is most important to you and rate its importance. Next, choose the value that is most opposed to (against) your values and rate it -1, or if there is no such value, choose the value least important to you, and rate it 0, or 1, according to its importance. Then rate the rest of the values.

VALUES LIST TWO	
INDEPENDENT (self-reliant, self-sufficient)	
MODERATE (avoiding extremes of feeling & action)	
LOYAL (faithful to my friends, group)	
AMBITIOUS (hard-working, aspiring)	
BROADMINDED (tolerant of different ideas and beliefs)	
HUMBLE (modest, self-effacing)	
DARING (seeking adventure, risk)	
PROTECTING THE ENVIRONMENT (preserving nature)	
INFLUENTIAL (having an impact on people and events)	
HONORING OF PARENTS AND ELDERS (showing respect)	
CHOOSING OWN GOALS (selecting own purposes)	
HEALTHY (not being sick physically or mentally)	
CAPABLE (competent, effective, efficient)	
ACCEPTING MY PORTION IN LIFE (submitting to life's	
HONEST (genuine, sincere)	
PRESERVING MY PUBLIC IMAGE (protecting my "face")	
OBEDIENT (dutiful, meeting obligations)	
INTELLIGENT (logical, thinking)	
HELPFUL (working for the welfare of others)	
ENJOYING LIFE (enjoying food, sex, leisure, etc.)	
DEVOUT (holding to religious faith & belief)	
RESPONSIBLE (dependable, reliable)	
CURIOUS (interested in everything, exploring)	
FORGIVING (willing to pardon others)	
SUCCESSFUL (achieving goals)	
CLEAN (neat, tidy)	
SELF-INDULGENT (doing pleasant things)	

PHASE TWO (Can't link back to our system after JTI to ask this question so need to ask it before we route to the JTI)

Before we continue to the last section of questions…

Would you like to volunteer to participate in phase two of the research? It will consist of face-to-face **in-depth personal interviews** of between 1-2 hours at a place convenient for you. You will be remunerated with R200 for your participation.

Yes	1	**CAPTURE (Autofill personal details from Q1 and if not provided capture here and include suburb)**
No	2	**CLOSE ("Thank you for your participation in the research")**

PERSONALITY (JTI)

You will now be redirected to an external site that contains the final set of copyrighted questions. You are nearly done…! You are welcome to skip through the first page that asks your personal details.

Appendix 13: Study background given to auditor

Study background given to auditor: Grounded Theory Audit

Note: This document has been put together for the sole purpose of the Grounded Theory audit. There is no need to check spelling, grammar, syntactical errors in this document or those that represent the typologies.

1.) Introduction

The goal of the study is to develop typologies to use as an ecopsychological framework for understanding the relationship that people have with the biosphere in South Africa. The study is guided by systems, and ecopsychological theory. Both these theories acknowledge the complexity inherent in obtaining an understanding of the human-nature relationship. In order to explore this complexity and by acknowledging the interdependence of factors that shape human worldviews (Liu & Lin, 2014), a non-linear methodology needs to be used. As such, the study made use of an explanatory sequential mixed methods design combined with grounded theory, which is non-linear in its approach to understanding the systems in which phenomena operate. This is a non-parallel approach where the researcher starts with quantitative data collection and analysis, followed by qualitative exploration (Todd, Nerlich & McKeown, 2004) and then using thematic and theoretical saturation to build theory (Bowen, 2008). This sequence (instead of exploratory sequential mixed methods design) was chosen in order to allow the researcher to quantitatively identify clusters based on a set of variables shown to potentially impact the relationship that people have with the biosphere. Exploratory sequential mixed methods design would have been appropriate if the researcher needed to identify variables first to include in the questionnaire (Todd, Nerlich & McKeown, 2004). Once clusters were identified and profiled the exploratory phase of the research allowed the researcher to explore each of the clusters (referred to as typologies in the qualitative phase) in more depth allowing for the unfolding of typological theory grounded in the data with the aim of understanding the underlying systems processes that influence the relationship that people have with the biosphere.

2.) Research questions

- Based on people's relationship with the biosphere and individual differences, which typologies exist in South Africa?
- How do typological systems differ from each other?
- What ecopsychological theory can be developed to describe each of the identified typologies?

3.) Methodology

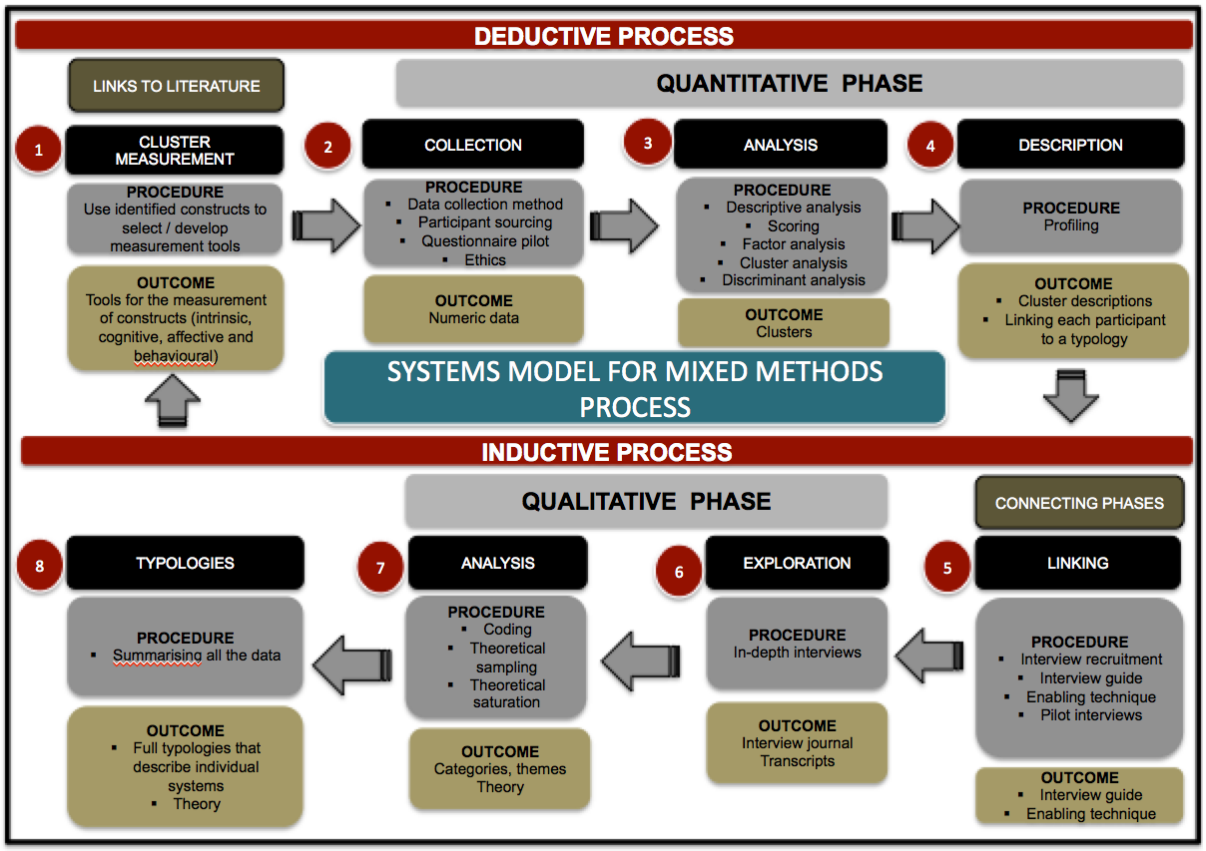
3.1) Systems model for mixed methods process

A systems model provides the study with a design and process that is able to deal with both complexity and dimensionality inherent in the building of typologies and subsequent theory within a pragmatic framework. The systems model for mixed methods process is based on the criteria for mixed method model development provided by Ivankova, Creswell and Stick (2006) and suggests treating both sets of data as equally illuminating, providing both breath and depth. The systems

approach for this study is characterized by circularity, compared to the linear process demonstrated by Ivankova, Creswell and Stick (2006) and moves from a deductive process to an inductive one.

The deductive process started with the identification of constructs to be measured based on existing literature. Based on the literature four constructs are identified namely: intrinsic, cognitive, affective and behavioural. These constructs informed the quantitative self-report questionnaire as well as subsequent cluster identification and profiling. The process then moved through to induction where the qualitative data collection and analysis took place with the aim of building typologies and theory. The final step is a summary that easily describes each typological system and its emerging theory through theoretical statements.

The purpose of this document is to provide a brief background of the study with the aim of auditing the process 6 & 7 in the below diagram which consisted of the Grounded Theory Analysis.



(Adaption of the visual model guidelines for mixed-methods designs developed by Ivankova, Creswell & Stick, 2006)

3.2) Description of the deductive process

Participants were recruited primarily using social media. A total sample of 753 was obtained for the quantitative phase. The quantitative phase made use of cluster analysis in order to group people together that have commonalities based on their connection to nature, worldviews, behaviour, attitudes, values and personality. Therefore, moving into the qualitative phase of the study the researcher already had an idea of what people that belong to the same cluster have in common and qualitative sampling took place according to the cluster the participant belonged to.

Based on the quantitative phase 6 types of people exist based on their relationship with nature. The below tables aim to show briefly what each of the typologies look like quantitatively.

	Cluster 1	**Cluster 2**	**Cluster 3**	**Cluster 4**	**Cluster 5**	**Cluster 6**
Sample for each Cluster	75	120	176	104	170	76

Variable	**Cluster descriptions**					
	Cluster 1	**Cluster 2**	**Cluster 3**	**Cluster 4**	**Cluster 5**	**Cluster 6**
Connectedness to nature	low	low-mod	mod-high	mod-high	high	low-mod
Shifts environmetnal responsiblities to others	high	mod	mod	high	v low	mod-high
Individuals should be resonsibile for the environment	mod	mod	mod-high	high	high	low-mod
Apathetic	v high	low-mod	mod	mod-high	v low	high
Concerned about issues that impact humanity	low	mod-high	mod	high	v high	v low
Concerned about resources	mod	high	mod	high	high	v low
Concerned about scientific issues related to environment	mod	v high	low	high	v high	v low

Variable	**Profiling descriptions**					
	Cluster 1	**Cluster 2**	**Cluster 3**	**Cluster 4**	**Cluster 5**	**Cluster 6**
Environmental worldviews	low	mod	mod	low-mod	v high	low-mod
Concern about the climate	mod	mod-high	low-mod	high	high	v low
Concern for animal exploitation	low	mod	low-mod	mod-high	v high	v low
Concern for animal extinction	low	high	mod	high	v high	v low
Government responsible for problems	mod-high	mod	mod	mod-high	low-mod	mod
Technology will solve problems	v high	low-mod	mod	high	low	mod

3.3) Description of the inductive process

Each participant that indicated that they are willing to participate in the qualitative research was allocated to an identified cluster based on the cluster algorithm and filtered on whether they are based in Johannesburg/Pretoria, Durban, Cape Town. These three major cities were chosen for the

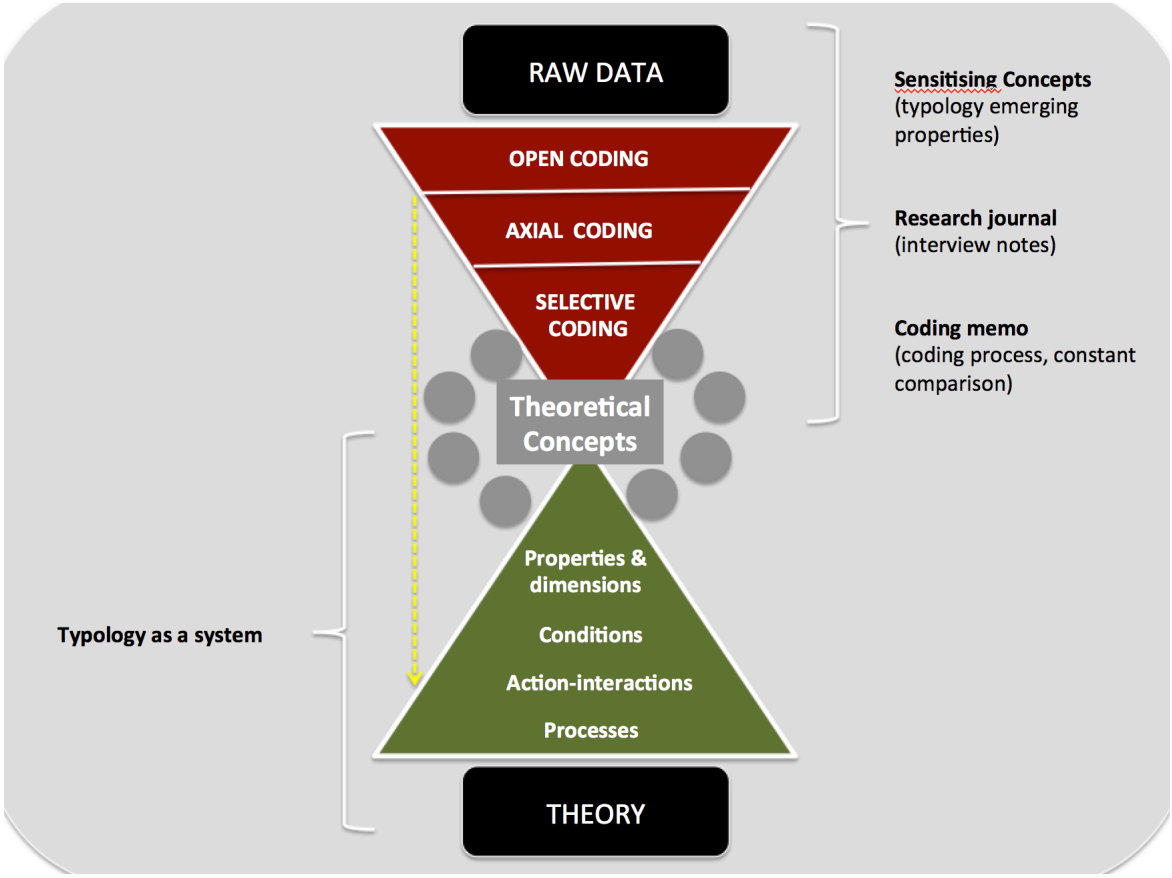
qualitative research as they hold the majority of participants; they are logistically accessible and represent the main carbon consumers of South Africa. The researcher approached the recruitment on a city-to-city basis, starting with Cape Town, then Durban and lastly Johannesburg/Pretoria. Johannesburg/Pretoria fieldwork was done last as most of the sample is situated there and therefore the researcher felt it would be easier to top up clusters that perhaps lacked participants from the other two cities.

A mixture of purposeful and maximal variation sampling was used. Purposive sampling was used where the participants were selected to participate based on their willingness and availability and their representation of a cluster (Teddlie & Yu, 2007). Within this the researcher applied the principle of maximal variation sampling within each cluster aiming to sample a range of different people within each cluster but this was heavily influenced by the amount of people available in each cluster and amount of people willing to participate. A sample of 44 was achieved for the qualitative phase.

	Typology 1	**Typology 2**	**Typology 3**	**Typology 4**	**Typology 5**	**Typology 6**
Interviews conducted for each Typology	7	8	8	8	7	6

The qualitative analysis followed the below process moving from raw data, through various cycles of coding up to building theory.

Figure: Straussian Grounded Theory using pragmatic approach.



Note: Above diagram designed by researcher.

3.4) The qualitative data was gathered using the following process:

- The interviews were conducted in rounds, city by city, with a lapse of about two weeks between the three cities.
- After the first rounds of interviews were conducted the researcher started looking for **sensitising topics** to listen out for or integrate into the next round of interviews. Because there were three cities there were three rounds of interviews.
- The researcher kept a **research journal** and wrote about the interview and participant after each in-depth interview. The research journal aimed to provide some subtle observations and ideas about the participant and the interview flow etc. This was used by the researcher to recall the interview and any nuances that might be important when deep analysis starts.
- After all the fieldwork was conducted all the interviews were **transcribed verbatim** and loaded into Atlas.ti for analysis.
- The researcher listened to every interview again in conjunction to checking all 44 transcripts.
- While the researcher moved through the different cycles of coding described below, the researcher sometimes made comments within the Atlas.ti comment function but also kept a **coding memo** throughout all cycles of coding noting important thoughts that emerged during the various coding cycles.

3.5) The qualitative data was analysed using the following process (drawing on Strauss & Corbin and Charmaz)

1.) Initial coding – Naming each sentence to mine early data for analytic ideas to pursue, remaining open to all theoretical directions, sticking close to the data, no pre-existing themes or categories applied, includes in vivo codes

2.) Axial coding – Choosing key categories and start coding around them, process of bringing the data back together again into a coherent whole, start looking for properties and dimensions, single category at a time at the centre of analysis

3.) Selective coding – Choosing the most significant categories and then coding until saturation is reached while finalizing properties dimensions, conditions (the circumstances or situations that form the structure of the studied phenomena), actions/interactions (Participants' routine or strategic responses to issues, events or problems), consequences (outcomes of actions/interactions), choosing core category, connecting emerging categories, expanding them further

Part of the selective coding process was theoretical coding = assembling the products of the coding, linking concepts into theory

Outcome = Generalizable theoretical statements that transcend specific times and places and contextual analyses of actions. This part consists of a theoretical statement and graphic showing the typology as a system.

Although the coding processes seem very rigid above they flowed more into one another with the axial coding sometimes already starting during the initial coding process.

It is important to note that the participants in each cluster / typology already had various aspects in common with each other based on the cluster analysis conducted during the quantitative phase of the study.

4.) Grounded theory auditing goals and outcomes

Grounded theory has various methods of validating the analysis and theory. The first is the process of member checking which is where the researcher provides the participants with the theoretical statements for feedback. This is currently in the process of being done in order to check the perceived accuracy of the theory and hence the output of the analysis which is the theory.

The second method is Grounded theory auditing. Auditing is required to validate the process used during the analysis i.e. coding cycles used. Furthermore, the audit aims to ascertain the degree of trustworthiness of the data (Bowen, 2009)

- **Credibility** = The degree to which one can confidently believe that the finding represent truth (triangulation)
- **Transferability** = Other researchers can apply the findings of the study (thick descriptions of phenomena)
- **Dependability** = The idea that the findings are stable over time
- **Confirmability** = Internal coherence of the data in relation to the findings, interpretations and recommendations

“The purpose of the methodology is not to make truth statements about reality but rather to elicit fresh understandings about patterned relationships among social actors and how these relationships and interactions actively construct reality” (Glaser & Strauss, 1967)

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Appendix 14: Quantitative questionnaire pilot feedback

Quantitative Questionnaire Pilot feedback
Post Questionnaire Pilot Feedback
INTRODUCTION
Thank you for participating in my research study.
I would like to invite you to provide feedback regarding your experience completing the questionnaire. This feedback will be valuable as it will help me identify any issues that might occur in the study and allow me to address them timeously.
Should you decide to volunteer to provide feedback on your experience of completing my questionnaire, you will be given an additional entry into the lucky draw. This questionnaire will take you around 8-10 minutes to complete. You will have access to a pdf document that contains the questionnaire sections so that you can review them before answering the questions.
Are you prepared to provide feedback on your experience of completing the questionnaire?

Yes	1	**CONTINUE**
No	2	**CLOSE ("Thank you for participating"**

DEMOGRAPHICS
1.A **CONTACT DETAILS**
Would you like to provide your personal contact details for an additional entry into the lucky draw?

Yes	1	**CONTINUE (to personal details page Q 1B)**
No	2	**CONTINUE (skip personal details and go to Questions)**

1.B **PERSONAL CONTACT DETAILS**

Name	1	**CAPTURE**
Surname	2	**CAPTURE**
Mobile Phone Number	3	**CAPTURE**
Alternative phone Number	4	**CAPTURE**
Email address	5	**CAPTURE**

OVERALL FEEDBACK
2.A If you think about your **OVERALL EXPERIENCE** of completing the questions in the questionnaire battery how would you rate your experience in terms of the following…
0 = No opinion; 1 = Very poor; 2 = Poor, 3 = Fair 4 = Good, 5= Excellent

Overall comprehension	
Overall ease of completion	
Overall time it took to complete	

2.B Please type any comments you might have about your overall experience in the below space:

3. I would now like to remind you of the questions that you saw in each of the sections for some specific feedback. The questions are in the pdf link so that you can be reminded of what they were.
ENVIRONMENTAL ISSUES AND ATTITUDES QUESTIONNAIRE (EIAQ)
This section aims to understand some of the things you feel are important or less important in your life. Please remember to be as honest as possible, there is no wrong or right answer. All the answers should reflect how you feel personally.
1. **GENERAL ISSUES**
1.1 Please rank the **three issues** which are of **most importance** to you, in order of importance.

International tensions (e.g. terrorism, war)	
Economic concerns (e.g. unemployment, cost of goods)	
Political concerns (e.g. government, genocide, xenophobia)	
Environmental concerns (e.g. loss of biodiversity, global warming)	
Health concerns (e.g. cancer, AIDS)	
Social issues (e.g. poverty, discrimination, education, abuse)	
Personal safety (e.g. crime, theft)	
Religious concerns (e.g. sinning, offending)	

Personal freedom concerns (e.g. not being able to live life fully)	
Animal rights concerns (e.g. sentience of animals, cruelty, laws that protect)	

1.2 Please rank the **two issues** which are of **least importance** to you.

International tensions (e.g. terrorism, war)	
Economic concerns (e.g. unemployment, cost of goods)	
Political concerns (e.g. government, genocide, xenophobia)	
Environmental concerns (e.g. loss of biodiversity, global warming)	
Health concerns (e.g. cancer, AIDS)	
Social issues (e.g. poverty, discrimination, education, abuse)	
Personal safety (e.g. crime, theft)	
Religious concerns (e.g. sinning, offending)	
Personal freedom concerns (e.g. not being able to live life fully)	
Animal rights concerns (e.g. sentience of animals, cruelty, laws that protect)	

2. **ENVIRONMENTAL CONCERNS**

a. Overall, how would you describe your **level of awareness** about environmental problems during the past two years?

0 = I don't know; 1 = I am now less aware than before; 2 = My awareness is the same as before; 3 = I am more aware than before

b. How **concerned** are you about the following environmental issues?

0 = No opinion; 1 = Not concerned; 2 = A little concerned, 3 = Fairly concerned, 4 = Very concerned

Air pollution	
Water scarcity	
Climate change (i.e. changing weather patterns)	
Rising sea levels	
Global warming	
Natural disasters	
Natural resource depletion (e.g. forest, water, energy)	
Ocean acidification	
Noise pollution	
Ozone layer depletion	
Human overpopulation	
Loss of natural or nature-like areas e.g. Parks, open fields	
Nuclear energy	
Waste generation	
Water pollution	
Urbanisation (e.g. loss of natural world due to development)	
Use of pesticides	
Genetically modified foods (GMO)	
Over consumption (e.g. eating too much, using too many resources)	
Biodiversity loss (i.e. biodiversity is the variety of living things and the natural environents that support them. Loss of biodiversity means loss of species of living things through development, pollution or natural processes)	

2.1 **ENVIRONMENTAL CONCERNS ACCOUNTABILITY**

Out of these issues you have rated that you are concerned about, which do you feel you have control over i.e. you can make a difference or can have an impact on?

0 = I don't know; 1 = I have no control over this; 2 = I can maybe change something small or help in a small way, 3 = I have control over this, 4 = What I do could have a direct impact

3. **ANIMAL CONCERNS**

a. Overall, how would you describe your **level of awareness** about animals rights issues during the past two years?

0 = I don't know; 1 = I am now less aware than before; 2 = My awareness is the same as before; 3 = I am more aware than before

b. How **concerned** are you about the following issues pertaining to animals?
0 = No opinion; 1 = Not concerned; 2 = A little concerned, 3 = Fairly concerned, 4 = Very concerned

Animals used in entertainment (e.g. circus, aquarium)	
Canned lion hunting (i.e. lions bred in captivity and then kept in a confined area to increase the likelihood of the hunter obtaining a kill)	
The legal rights and protection of animals (i.e. laws that protect animals)	
Domestic animal breeding (i.e. people breeding dogs, cats, rabbits etc. for monetary gain)	
Wild animal breeding programmes (i.e. unnatural breeding of wild animals using methods such as artificial insemination)	
Deforestation (e.g. wild animals killed to make space in areas such as forests for farming)	
Over-fishing	
Whale hunting	
Dolphin capturing (e.g. taking them from the wild into captivity)	
Animal cruelty / abuse	
Factory farming	
Domestic animal welfare (condition and care of domestic animals)	
Farm animal welfare (how animals are looked after, transported, sold, slaughtered or exported)	
Poaching	
Trophy hunting	
Animals used for testing/experimentation (e.g. vivisection, medical research)	
Animals used for consumer products (e.g. fur, leather, wool, lactose, down feathers)	
Other (please specify)	

3.1 **ANIMAL CONCERNS ACCOUNTABILITY**
Out of these issues you have rated that you are concerned about, which do you feel you have control over i.e. you can make a difference or have an impact?
0 = I don't know; 1 = I have no control over this; 2 = I can maybe change something small or help in a small way, 3 = I have control over this, 4 = What I do could have a direct impact

4. **ATTITUDES**
To what extent do you agree or disagree with the following statements
99 = Don't know; 1 = Strongly disagree; 2 = Disagree, 3 = Neutral 4 = Agree, 5 = Strongly agree

ENVIRONMENT	
Each individual/household can contribute to a better environment	
Environmental impacts are often overstated	
Environmental issues should be dealt with primarily by future generations	
Environmental issues will be resolved primarily through technological progress	
The government is responsible for the welfare of the environment	
We must sacrifice ecomomic growth in order to preserve and protect the environment	
We must be prepared to sacrifice environmental quality for economic growth	
DOMESTIC ANIMALS	
Each individual/household can contribute to domestic animal welfare and protection	
Issues around the welfare of domestic animals are often overstated	
Issues around domestic animals should be dealt with primarily by future generations	
Domestic animal issues will be resolved primarily through technological progress	
The government is responsible for the welfare of domestic animals	
Domestic animals are a key source of economic growth and job creation	

FARM ANIMALS	
Each individual/household can contribute to farm animal welfare and protection	
Issues around the welfare of farm animals are often overstated	
Issues around farm animals should be dealt with primarily by future generations	
Farm animal issues will be resolved primarily through technological progress	
The government is responsible for the welfare of farm animals	
Farm animals are a key source of economic growth and job creation	
WILD ANIMALS	
Each individual/household can contribute to wild animal welfare and protection	
Issues around the welfare of wild animals are often overstated	
Issues around wild animals should be dealt with primarily by future generations	
Wild animal issues will be resolved primarily through technological progress	
The government is responsible for the welfare of animals in the wild	
Wild animals need to contribute economically to deserve protection	
GENERAL	
I find it hard to change my habits to be more environmentally-friendly	
I don't believe that my behaviour and lifestyle contributes to environmental destruction	
Environmental problems is not a priority for me	
The effects of environmental destruction, such as climate change, is too far in the future to concern me	
It takes too much effort to adopt an environmentally friendly lifestyle	

Questions pertaining to above Questionnaire: (open ended)

- To what extent was the **instruction easy to understand and follow**? Please specify.
- Are there any statements in this questionnaire that you felt were **unclear or difficult to understand**? Please specify.
- Are there any statements that you feel were **irrelevant/unnecessary** in this questionnaire? Please specify.
- Are there any statements that you feel should be **reworded**? Please specify.
- Are there any statements that you feel is **missing**? Please specify.

BEHAVIOURAL QUESTIONNAIRE (BQ)

This section aims to explore some of your own behaviours. Please remember to be as honest as you can when responding to the questions as there are no right or wrong answers. The information that you are contributing is of great importance and value.

To what extent do you (or your household) participate in the following behaviours?

99 = Don't know/NA; 1 = Never do it; 2 = Sometimes do it, 3 = Often do it, 4 = Always do it

WASTE	
Recycle glass bottles/containers	
Recycle plastic bottles/containers	
Recycle aluminium, tin and steel cans	
Recycle paper/cardboard	
Recycle food waste (e.g. compost)	
Recycle batteries (REMOVE bracket on online version)	
Recycle pharmaceuticals/medicines	
Re-use glass bottles/containers	
Re-use plastic bottles/containers	
Re-use aluminium, tin and steel cans	
Re-use paper/cardboard	

Pick up litter when possible e.g. in public places	
Use own bags/reusable bags for shopping	
Do not waste food / let food go off	
TRANSPORT	
Car pool/share	
Use public transport	
Reduce air travel for only neccesities	
Use recycled tires/low rolling resistance tires	
Offset carbon emissions (e.g. planting trees)	
Find ways to reduce fuel consumption	
Walk or cycle instead of using a car/taxi/bus	
Adapt driving style to use less fuel	
ENERGY	
Switch off lights when not needed	
Reduce swimming pool pump usage	
Use energy-saving lightbulbs	
Use stove and other electric appliances less	
Make use of solar power	
Reduce use of high consumption appliances such as dishwashers, clothing dryers	
Cut down on heating/air conditioning	
Wait until you have full loads when using washing machines or dishwasher	
Turn off appliances when not in use	
Switch off standby mode of appliances/electronic devices	
PURCHASE AND CONSUMPTION	
Purchase products that generate the least amount of waste	
Eat less animal based foods (e.g. milk, meat, cheese, eggs)	
Purchase organic products	
Buy fair trade products	
Buy fish that are not endangered (i.e. Look for the SASSI symbol)	
Purchase and consume free range meat, eggs, dairy	
Purchase from companies that ethically source and manufacture their products and ingredients	
Carbon count products that are purchased	
Boycott companies who are bad for the environment or animals	
Buy foods produced locally (i.e. in South Africa or in your city/neighbourhood)	
Use products that are less destructive for the environment (e.g. biodegrable cleaning products, biofriendly fuel, re-usable nappies, mooncups instead of tampons)	
WATER	
Bath less, shower more	
Shorter showers	
Turn off water while brushing teeth	
Reduce general water use	
Capture rain water for use	
Use grey water for the garden / recycle waste water	
Plug the sink when washing the dishes	
Water garden in the coolest part of the day to reduce evaporation	

Use water efficient toilets	
Use water efficient appliances (e.g. washing machine)	
GENERAL	
Contribute money to an environmental, conservation, or wildlife protection group	
Contribute money to a domestic or farm animal welfare group	
Do volunteer work for an environmental, conservation or wildlife protection group	
Do volunteer work for a domestic or farm animal welfare group	
I encourage wildlife in my garden (e.g. through feeding areas, planting)	
I grow my own vegetables and fruits	

Questions pertaining to above Questionnaire: (open ended)

- To what extent was the **instruction easy to understand and follow**? Please specify.
- Are there any statements in this questionnaire that you felt were **unclear or difficult to understand**? Please specify.
- Are there any statements that you feel were **irrelevant/unnecessary** in this questionnaire? Please specify.
- Are there any statements that you feel should be **reworded**? Please specify.
- Are there any statements that you feel is **missing**? Please specify.

CONNECTION TO NATURE (CNS)

Please answer each of these questions in terms of the way you generally feel. There are no right or wrong answers. Using the following scale, state as honestly and candidly as you can what you generally experience.

1 = Strongly Disagree,2, 3 = Neutral, 4, 5 = Strongly Agree

I often feel a sense of oneness with the natural world around me	
I think of the natural world as a community to which I belong	
I recognise and appreciate the intelligence of other living organisms	
I often feel disconnected from nature	
When I think of my life, I imagine myself to be part of a larger cyclical process of living	
I feel as though I belong to the earth as equally as it belongs to me	
I often feel a kinship with animals and plants	
I have a deep understanding of how my actions affect the natural world	
I often feel part of the web of life	
I feel that all inhabitants of earth, human, and nonhuman, share a common 'life force'	
Like a tree can be part of a forest, I feel embedded within the broader natural world	
When I think of my place on earth, I consider myself to be a top member of a hierarchy that exists in nature	
I often feel like I am only a small part of the natural world around me, and that I am no more important than the grass on the ground or the birds in the trees	
My personal welfare is independent of the welfare of the natural world	

Questions pertaining to above Questionnaire: (open ended)

- To what extent was the **instruction easy to understand and follow**? Please specify.
- Are there any statements in this questionnaire that you felt were **unclear or difficult to understand**? Please specify.

NEW ECOLOGICAL PARADIGM SCALE (NEP)

Listed below are statements about the relationship between humans and the environment. For each one, please indicate your extent of agreement or disagreement with the statement:
1=Strongly disagree, 2=Mildly Disagree, 3=Unsure, 4 = Mildly Agree, 5=Strongly agree

We are approaching the limit of the number of people the earth can support	
Humans have the right to modify the natural environment to suit their needs	
When humans interfere with nature it often produces disastrous consequences	
Human ingenuity will ensure that we do NOT make the Earth unliveable	
Humans are severely abusing the environment	
The earth has plenty of natural resources if we just learn how to develop them	
Plants and animals have as much right as humans to exist	
The balance of nature is strong enough to cope with the impacts of modern industrial nations	
Despite our special abilities, humans are still subject to the laws of nature	
The so-called "ecological crisis" facing humankind has been greatly exaggerated	
The earth is like a spaceship with very limited room and resources	
Humans were meant to rule over the rest of nature	
The balance of nature is very delicate and easily upset	
Humans will eventually learn enough about how nature works to be able to control it	
If things continue on their present course, we will soon experience a major ecological catastrophe	

Questions pertaining to above Questionnaire: (open ended)

- To what extent was the **instruction easy to understand and follow**? Please specify.
- Are there any statements in this questionnaire that you felt were **unclear or difficult to understand**? Please specify.

SCHWARTZ VALUE SURVEY (SVS)

In this questionnaire you are to ask yourself: "What values are important to ME as guiding principles in MY life, and what values are less important to me?"

There are two lists of values. These values come from different cultures. In the parentheses (brackets) following each value is an explanation that may help you to understand its meaning.

Your task is to rate how important each value is for you as a guiding principle in your life. Use the rating scale below:

0--means the value is not at all important, it is not relevant as a guiding principle for you.

3--means the value is important.

6--means the value is very important.

The higher the number (0, 1, 2, 3, 4, 5, 6), the more important the value is as a guiding principle in YOUR life.

-1 is for rating any values opposed (against) to the principles that guide you.

7 is for rating a value of supreme importance as a guiding principle in your life; ***ordinarily there are no more than two such values.***

In the dropdown list choose the value (-1,0,1,2,3,4,5,6,7) that indicates the importance of that value for you, personally. Try to distinguish as much as possible between the values by using all the numbers. You will, of course, need to use numbers more than once.

Before you begin, read the values in the below list, choose the one that is most important to you and rate its importance.

Next, choose the value that is most opposed to your values and rate it -1. If there is no such value, choose the value least important to you and rate it 0 or 1, according to its importance. Then rate the rest of the values in list.

VALUES LIST ONE	
EQUALITY (equal opportunity for all)	
INNER HARMONY (at peace with myself)	
SOCIAL POWER (control over others, dominance)	
PLEASURE (gratification of desires)	
FREEDOM (freedom of action and thought)	
A SPIRITUAL LIFE (emphasis on spiritual not material matters)	
SENSE OF BELONGING (feeling that others care about me)	
SOCIAL ORDER (stability of society)	
AN EXCITING LIFE (stimulating experiences)	
MEANING IN LIFE (a purpose in life)	
POLITENESS (courtesy, good manners)	
WEALTH (material possessions, money)	
NATIONAL SECURITY (protection of my nation from enemies)	
SELF RESPECT (belief in one's own worth)	
RECIPROCATION OF FAVORS (avoidance of indebtedness)	
CREATIVITY (uniqueness, imagination)	
A WORLD AT PEACE (free of war and conflict)	
RESPECT FOR TRADITION (preservation of time-honored customs)	
MATURE LOVE (deep emotional & spiritual intimacy)	
SELF-DISCIPLINE (self-restraint, resistance to temptation)	
PRIVACY (the right to have a private sphere)	
FAMILY SECURITY (safety for loved ones)	
SOCIAL RECOGNITION (respect, approval by others)	
UNITY WITH NATURE (fitting into nature)	
A VARIED LIFE (filled with challenge, novelty and change)	
WISDOM (a mature understanding of life)	
AUTHORITY (the right to lead or command)	
TRUE FRIENDSHIP (close, supportive friends)	
A WORLD OF BEAUTY (beauty of nature and the arts)	
SOCIAL JUSTICE (correcting injustice, care for the weak)	

Now rate how important each of the following values is for you as a guiding principle in YOUR life.

These values are phrased as ways of acting that may be more or less important for you. Once again, try to distinguish as much as possible between the values by using all the numbers.

Before you begin, read the values in the below list, choose the one that is most important to you and rate its importance. Next, choose the value that is most opposed to (against) your values and rate it -1, or if

there is no such value, choose the value least important to you, and rate it 0, or 1, according to its importance. Then rate the rest of the values.

VALUES LIST TWO	
INDEPENDENT (self-reliant, self-sufficient)	
MODERATE (avoiding extremes of feeling & action)	
LOYAL (faithful to my friends, group)	
AMBITIOUS (hard-working, aspiring)	
BROADMINDED (tolerant of different ideas and beliefs)	
HUMBLE (modest, self-effacing)	
DARING (seeking adventure, risk)	
PROTECTING THE ENVIRONMENT (preserving nature)	
INFLUENTIAL (having an impact on people and events)	
HONORING OF PARENTS AND ELDERS (showing respect)	
CHOOSING OWN GOALS (selecting own purposes)	
HEALTHY (not being sick physically or mentally)	
CAPABLE (competent, effective, efficient)	
ACCEPTING MY PORTION IN LIFE (submitting to life's circumstances)	
HONEST (genuine, sincere)	
PRESERVING MY PUBLIC IMAGE (protecting my "face")	
OBEDIENT (dutiful, meeting obligations)	
INTELLIGENT (logical, thinking)	
HELPFUL (working for the welfare of others)	
ENJOYING LIFE (enjoying food, sex, leisure, etc.)	
DEVOUT (holding to religious faith & belief)	
RESPONSIBLE (dependable, reliable)	
CURIOUS (interested in everything, exploring)	
FORGIVING (willing to pardon others)	
SUCCESSFUL (achieving goals)	
CLEAN (neat, tidy)	
SELF-INDULGENT (doing pleasant things)	

Questions pertaining to above Questionnaire: (open ended)

- To what extent was the **instruction easy to understand and follow**? Please specify.
- Are there any statements in this questionnaire that you felt were **unclear or difficult to understand**? Please specify.

"Thank you very much for your time and effort"

Appendix 15: Cluster maps

Cluster Maps

Cluster 1 **N = 7**	• They show undercurrents of a strong need for survival • They show fear of failure • They describe situations in which they seem lonely • They have a strong need to belong • They have a general mistrust of people • They are persistent in pursuing things which will provide them with a feeling of success or achievement • They come across as independent and/or domineering • They are highly religious • They have either had experiences of abandonment or fear being abandonment • They show a need for control and power • They are focused on resources and have an exploitative mindset • They are driven by materialist values • Their identity is dependent on their ability to achieve status • They are influenced by patriarchy
Cluster 2 **N = 8**	• Technology centered life • Alienated from society but very close to family • Highly rational worldview • Appreciates the value of nature • Rationalises climate change • Nature as 'out there' • Follower, likes to conform • Feels judged by world • Portrayal of balanced family life • Sense of self sabotage • Education very important • Nature is human nature or direct environment
Cluster 3 **N = 8**	• Anger • A general feeling of being unsafe • Feeling of vulnerability • Change needs to happen but others need to change • Difficult relationship with mother • Sense that they had to become hard / need to protect themselves • Suggestion of mental illness (depression/ anxiety emerges explicitly) • Childhood trauma • Disconnect from nature
Cluster 4	• Open to plant based living

N = 8	• Connects to nature through children • Idealistic • Optimistic • Comes across as somewhat superficial / important to make an impression • Hero archetype, they want to be heroes and be looked up to, wants to be recognised • Father a pastor that was very focused on money, typology focused on material gain • Positive relationship with their fathers • Disappointed in nature / fear of nature • Religious • High energy • Power and success important • Focused on leaving a legacy
Cluster 5 **N = 7**	• Humans need nature but nature does not need humans • A focus on their own behaviour and acknowledgement that humans are not that important • Low judgment • Open to talk and share sense of less boundaries • Unintentional destruction • Respect for others • 'natural' consumption is moral i.e. cows lived happy life before slaughtered (sustainability = Hero type; Ethical = Explorer type?) • Acknowledgement that living as a human faced with constant contradiction • Sense of guilt for being human and impact has • Humans not important enough o be the cause of natural disasters such as earthquake in Italy • Discomfort with capitalist system • Not career oriented • Recognition of interconnectedness • More than just the experience of nature but also the feeling of nature / humans no longer part of nature • Trying to fix the world through children, works with street kids, adopted children • Need new experiences, cultures, people need to connect with broader life • Open minded • Spiritual intimacy • Concern, pain for the natural world
Cluster 6 **N = 6**	• Emotionally blunt / "wishes he could feel more" / Apathetic • Creative

	• Nature does not care about us • Impatient • Struggles with relationships • Loner/isolated/reads a lot • Lot of debt • Does not care about nature – self more important • Does not look after self • Lives an isolated life • Cannot clearly see how humans are part of nature • Not prepared to make any sacrifices for nature or animals • Shopping – pleasure • Does not know nature very well, he is off to her some days, nature is a male figure • Introverted, socially awkward / Does not like to spend time with people • Does not want children • It is all about pleasurable experiences • Anti labels

Appendix 16

Additional Quantitative results

A. Typology by province

The typologies were represented across major cities in Gauteng, Western Cape and KwaZulu-Natal. This corresponds to South African population statistics where Gauteng makes up 25.5% of the share of the total population, KwaZulu-Natal 19.7% and the Western Cape 11.5% (www.gov.za, 2019). The Eastern Cape and other areas also had some representation across typologies. Figure 39 shows Typology by province.

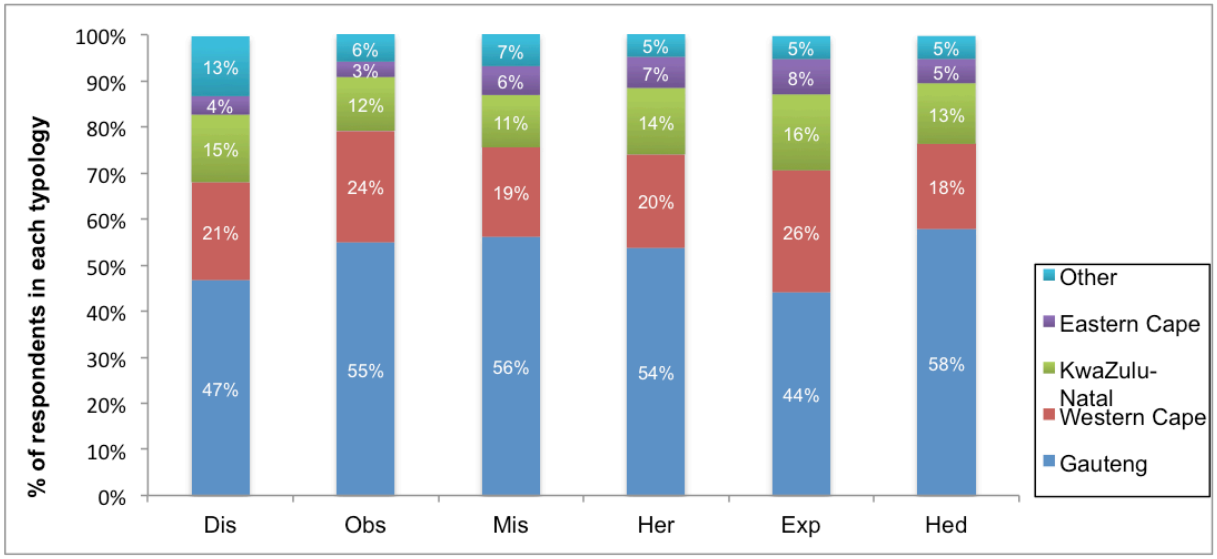


Figure 39: Typology by province (N= 721)

The *Observer*, *Misunderstood*, *Hero* and *Hedonist* had the most participants from Gauteng. The *Explorer* had more participants from the Western Cape compared to other typologies and the *Disconnected* had the most 'other' that suggests they might originate from outlaying or rural areas.

B. Typology people in home growing up

There was no significant relationship between the numbers of parents (X^2=24.51; p=0.053), or siblings typologies grew up with (X^2=26.49; p=0.033).

C. Typology and grandparents

There was a significant relationship between the number of grandparents and typology (X^2=39.31; p = 0.006) where the *Hero* had fewer participants with no grandparents and more participants with one grandparent. The *Misunderstood* and *Explorer* had more participants with no grandparents compared to other typologies. Figure 40 shows Typology and their grandparents.

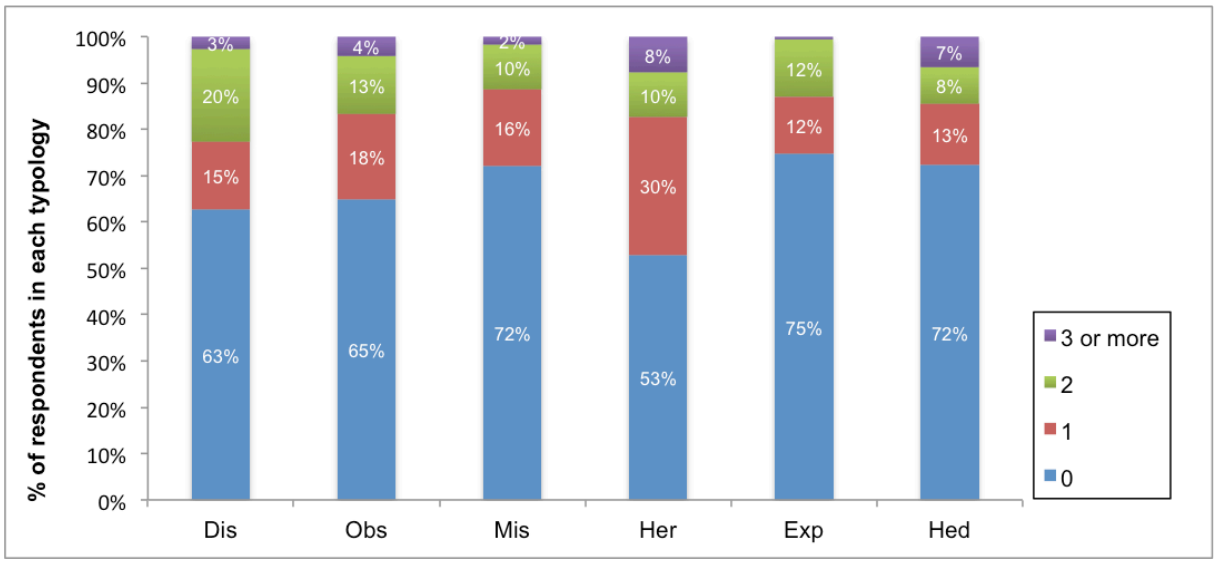


Figure 40: Typology and grandparents

D. Typology aunts and uncles

There was a significant relationship between the number of aunts/uncles and typology (X^2=28.24; p=0.020) where the *Hero* had fewer participants with no aunts/uncles and more participants with one aunt/uncle. The *Explorer* had more participants with no aunts/uncles compared to other typologies. Figure 41 shows Typology aunts and uncles.

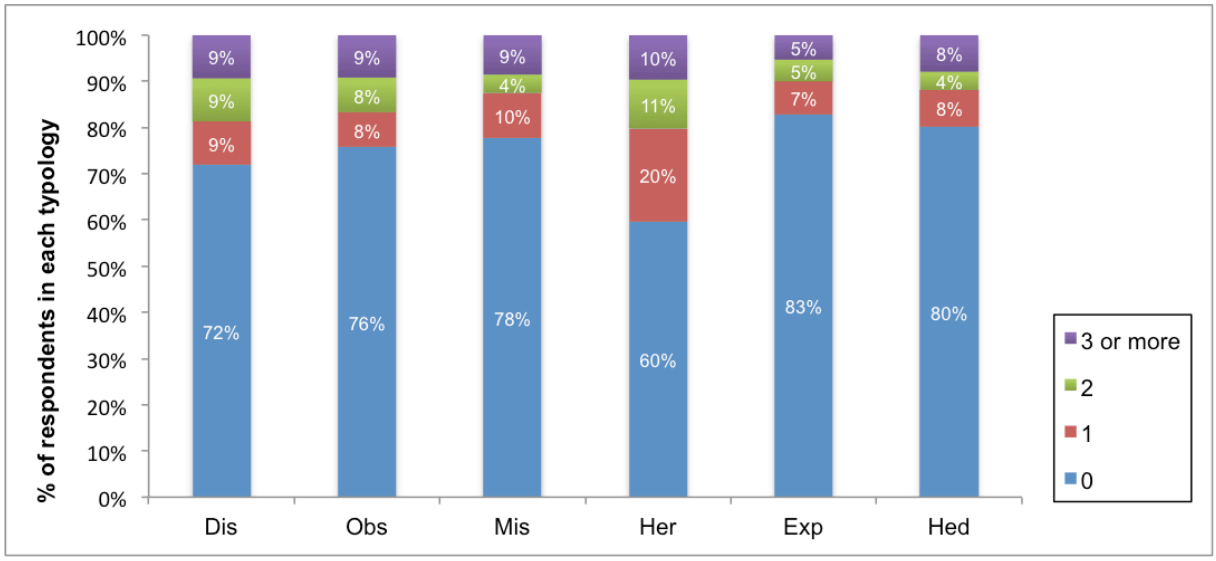


Figure 41: Typology aunts and uncles

E. Typology and amount of relatives

There was a significant relationship between the number of other relatives and typology (X^2=35.86; p=0.0019) where the *Hero* had fewer participants with no other relatives and more participants with 3+ other relatives. The *Explorer* and *Hedonist* had more participants with no other relatives compared to the other typologies. Figure 42 shows Typology and amount of relatives.

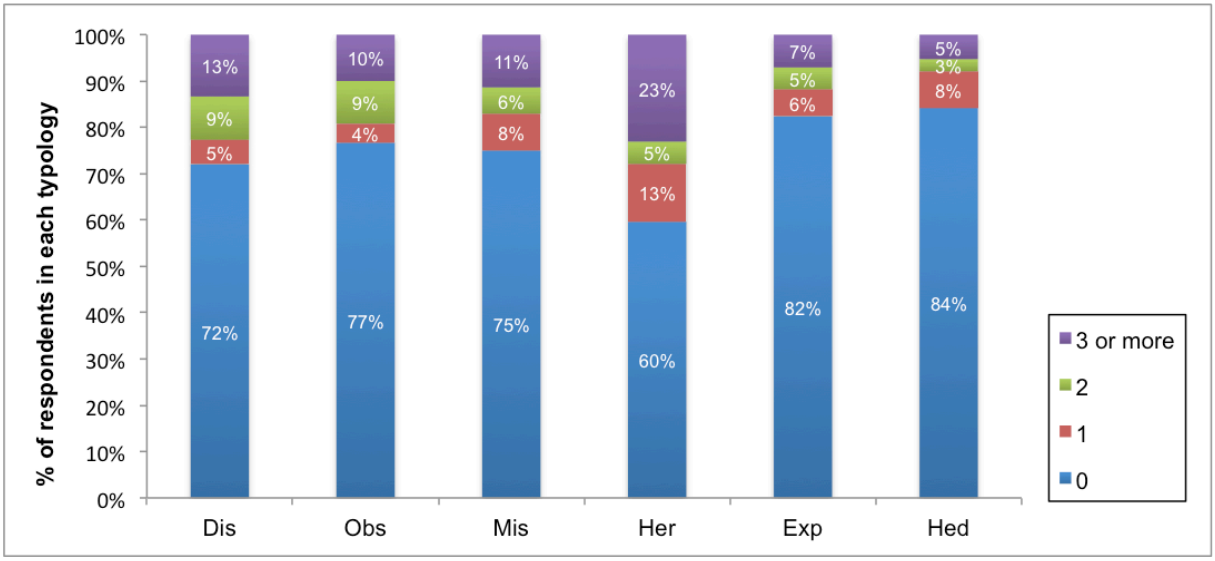


Figure 42: Typology and amount of relatives

F. Mother education by typology

There was a significant relationship between the education level of the mother and typology (X^2=40.59; p = 0.0042). Figure 43 shows the mother's education per Typology.

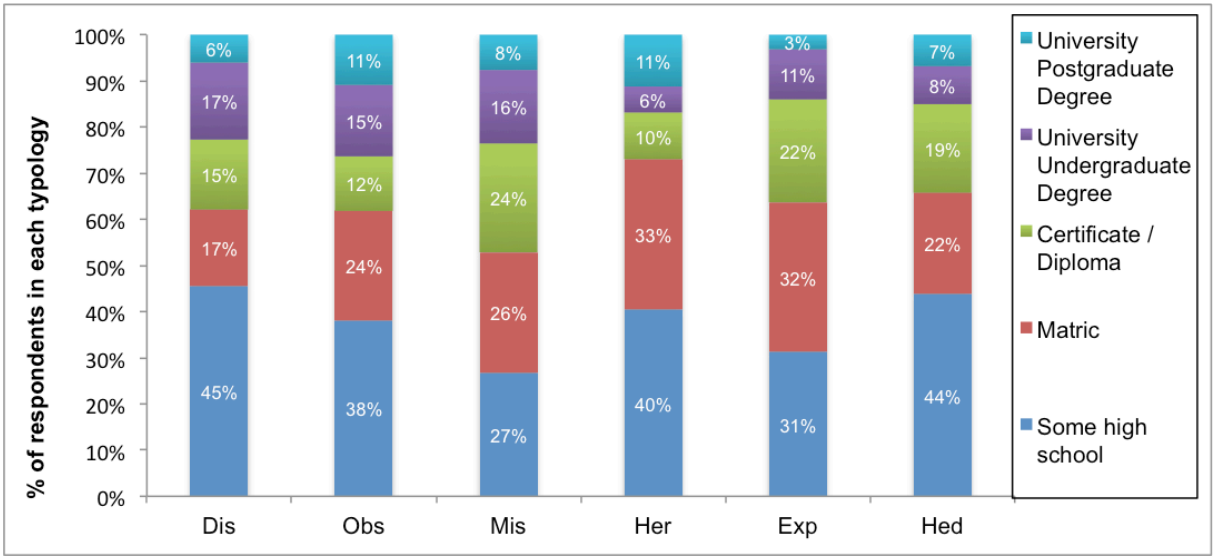


Figure 431: Mother education by typology (N = 652)

The *Disconnected* and *Hedonist* contains more participants and the *Misunderstood* fewer participants whose mothers had some high school education compared to other typologies. The *Explorer* had more participants with mothers who had a matric compared to other typologies. The *Misunderstood* had more, and the *Hero* had fewer participants with mothers who had a certificate/diploma compared to the other typologies.

G. Father education by typology

There was no significant relationship between the education level of the fathers and typology (X^2=33.00; p=0.0034).

H. Typology and their type of employment

In the overall sample, 48.5% of participants that were employed were salaried office employees. Participants who indicated that they were full-time, part-time or self-employed but not currently working or volunteer (excluding other; n = 517) there was no significant relationship between occupation and typology (X^2=36.46; p=0.039).

I. Typology household area

In the overall sample, 47.7% of participants live in suburban and 35.7% in urban areas. There was a significant relationship between household area and typology (X^2=48.13; p=0.0036). Figure 44 shows Typology and the household area.

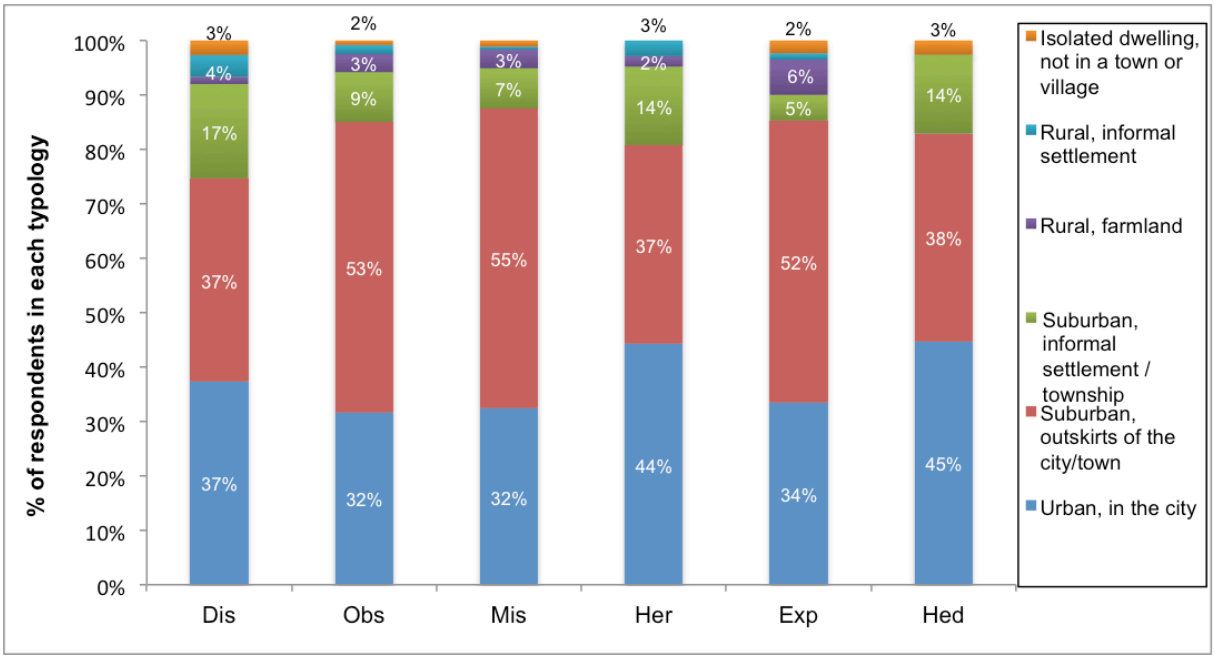


Figure 44: Typology household area (excluding other; N = 721)

The *Hero* and the *Hedonist* had more, and the *Observer* and the *Misunderstood* fewer people living in urban areas compared to the other typologies. The *Observer*, *Misunderstood* and *Explorer* contain more participants living in suburban areas compared to the other three typologies. The *Explorer* contains fewer participants that stay in informal settlements compared to the other typologies.