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A Typology of Psychological Oneness Concepts and its Relation to Prosocial and Pro-Environmental Tendencies

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Abstract

"Oneness", in general, is a sense of profound connection, typically to large ("self-transcendent") entities. Oneness may predispose people to prosocial and pro-environmental tendencies (ProTs; in the form of e.g., values, motivations and behaviours), which is a trend consistently supported by the literature. However, the many oneness concepts and measures in the literature were observed to contain important variation that had yet to be systematically untangled and organised. To that end, concepts in the literature that attempted to describe and measure oneness were reviewed, and key themes within this literature were arranged into a typology. One key distinction the typology made was between oneness experiences and oneness beliefs/feelings, where oneness experiences are transient, ineffable feelings of unity with the other, and oneness beliefs/feelings represent longer lasting propositions or intuitions about how self and other are connected. Another key distinction was that the perceived nature of this connection between self and other can take the form of expansion (including the other in the self), interdependence (self and other forming a symbiotic relationship), or essential (self and other sharing some fundamental property or substance). These distinctions were supported using factor analysis, for both oneness with nature and oneness with humanity.

The relationship between oneness and ProTs was re-examined using these key distinctions implied by the typology, with the intention of developing a more nuanced understanding of this relationship. No nuance was added to this relationship for oneness with humanity. However, for oneness with nature, expansion and interdependence uniquely predicted helpful tendencies – expansion acting through biospheric concern (intrinsically valuing nature), and interdependence acting directly. Further, both expansion and interdependence mediated the relationship between experiences and ProTs, suggesting that beliefs/feelings about oneness represent a mechanism by which oneness experiences can influence ProTs beyond the end of the experience itself. These results suggest that the oneness typology makes important distinctions, and also suggest that language emphasising expansion and interdependence may be particularly useful for turning oneness experiences into ProTs in the nature domain, at least in a sample of first year psychology students in a New Zealand University. Future research is needed to explore how different cultural and demographic factors influence the relative importance of expansion, essential and interdependence types of oneness for ProTs and any other outcomes of interest.
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This PhD has impacted the lives of people around me. I’m so grateful for all of their support and encouragement.

My band mates have been playing fewer gigs than they otherwise would like, because of the PhD. Guys, I’ll be back in full swing soon.

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Dad was lucky living in Palmerston North, because it meant he didn’t have to live with PhD Ties. As a psychotherapist and psychologist himself, he is one of the main reasons I studied psychology. He also helped me over the phone through some of my most difficult times. My sister Emily, in the Netherlands, was also supportive over the phone, and in person when I visited twice over the past four years.

Jess, my partner, has compromised the most. The kinds of things that people our age tend to think about have been pushed to the PhD horizon for years. Our lives would have been quite different had I taken another path. My guess is it would have involved more comfortable living scenarios, more time at beaches, more mental and emotional capacity to give to whatever we do together, and less canned food. Thank you for sticking by me.

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Preface and outline of thesis structure

This thesis explores oneness as a cluster of consciously accessible psychological phenomena that contribute to a person’s construal of how their existence relates to the existence of other entities, particularly large abstract entities like humanity, nature, or even all of existence. Humans seem to have an intuitive sense of what it means to be or feel “at one with” others, and there is a substantial literature on the “self” as a flexible construct that can be said to “merge” or “overlap” with things that would otherwise be considered outside of the self. However, when I discovered the concept of oneness in the psychological literature, it intrigued me because there were many specific oneness concepts that seemed to describe and measure roughly the same thing (albeit at different physical scales), but it was not clear how they really differed, nor whether any differences were important for other psychological phenomena.

The same literature also showed oneness as a promising general orientation that could promote prosocial and pro-environmental tendencies (ProTs), which is a goal I wanted my thesis to contribute towards. So I sought to clarify the psychological literature on conscious manifestations of oneness, with the intention of using this conceptual clarification to contribute to the understanding of how oneness relates to ProTs.

My interest in oneness came from a curiosity about the circumstances that lead people to place a high importance on, and feel good about, acting in prosocial and pro-environmental ways. That curiosity led me to Daniel Batson’s (2011) empathy-altruism hypothesis, which is, to my knowledge, the most thorough model and research project on altruism, at least in the psychological literature. According to Batson’s model, altruism is a motivational state (not a behaviour) in which increasing another’s welfare is an ultimate goal, where an ultimate goal is something that is perceived to have intrinsic value (i.e., to be an end in itself). This definition of altruism required an intriguing proposition. Namely, that one can intrinsically value something other than the self.

Part of this intrigue arose, for me, from Cialdini and his colleagues’ argument that the proposition was practically impossible. In their (1997) paper titled Re-interpreting the Empathy-Altruism Hypothesis: When One into One Equals Oneness, Cialdini and his colleagues argued that the circumstances that produce Batson’s altruistic motivation also produce an overlap between self and other. If this were true, then purportedly altruistic motivations cannot be other-oriented, and therefore cannot satisfy Batson’s definition of
altruism. However, this seemed too simplistic to me, partly for methodological reasons (e.g., Cialdini et al. measured oneness with a single, pictorial scale that had been shown to be open to interpretation), but also partly because their conceptualisation of oneness simply as “other as self” seemed to be missing potentially important theoretical nuances. Although the goal of the thesis was not to protect the plausibility of Batson’s altruism by identifying a type of oneness that produced a sense of intrinsically valuing the other while maintaining a meaningful distinction between self and other, this particular debate drew my attention to the concept of oneness. From there, it seemed to me that the idea of oneness in relation to ProTs was promising, interesting and not yet sufficiently developed. So I sought to develop it.

This thesis is structured in roughly chronological order, such that it reflects the development of my ideas throughout the four years of study. The introduction is the only exception to this, as it was written after Chapters 2-5 were complete, but before writing Chapter 6.

In the introduction, Chapter 1, I introduce the main arguments of this thesis, and the key concepts used in these arguments. Chapters 2-5 are written in the form of stand-alone research papers, each including an “abstract” (overview).

Chapter 2 presents the results of a pilot study that sought to test for a causal relationship between oneness and prosocial aspirations. The pilot study was based on an initial review of the psychological oneness literature, which revealed plentiful evidence for a correlation between various oneness measures and prosocial and pro-environmental tendencies (ProTs), but relatively sparse evidence for a causal relationship. However, the pilot study research was undertaken before developing the oneness typology that became the main focus for the rest of the PhD, so it does not centre on the kinds of distinctions implied by the typology. Indeed, the unexpected results in the pilot study prompted me to review the oneness literature more thoroughly, which in turn led to the development of the typology.

Chapter 3 takes the form of a conceptual paper in which I reviewed the oneness literature and used it to support the construction of the oneness typology. The typology was intended to perform three roles: 1) provide a more thorough conceptual definition of oneness; 2) provide a conceptual framework to help understand and compare the many oneness concepts in the literature; and 3) inform future research, both by providing concepts and language that helps researchers to select an appropriate type of oneness for their research, and
by generating novel predictions worth investigating. Chapter 3 also constitutes part of the main literature review of the thesis (Chapter 1 constituting the other part).

Chapter 4 reports the results of two factor analysis studies that aimed to statistically support the distinctness of the types of oneness outlined in the typology. The results led to a refinement of the operational definitions of aspects of the oneness typology, and also provided new scales for use in the final study and potential future research.

Chapter 5 reports the results of a study that sought to test whether the different types of oneness outlined in the typology, and measured using the scales produced in Chapter 4, differentially predict ProTs. It also sought to integrate into one path model the relationships between transient oneness experiences, more stable oneness beliefs/feelings, intrinsically valuing the other, and behaviour or aspirations to behave in the interest of the other.

Chapter 6 is a general discussion that summarises the key findings and implications of the research presented in Chapters 2-5. It also focuses on three general discussion points that relate to the thesis as a whole. Namely, revisiting Batson’s altruism in light of the findings and theorising throughout the thesis; possible future adjustments to the typology; and how limitations of the thesis can be addressed in future research, with an emphasis on future cross-cultural research.

I entered the PhD process wanting to learn more about oneness and its role in producing a salient sense of deeply valuing others and the world at large. I had a hunch, based partly on personal experience and partly on the literature, about the patterns that this thesis would reveal. I’m grateful that I turned out to be rather wrong. Through the difficult task of seeking to understand the unexpected results, I’ve explored more nuanced relationships between ProTs and various oneness phenomena than I otherwise would have. I believe the oneness typology presented in this thesis captures useful, generalisable variation, but an important and exciting next step is exploring the ways that it interacts with cultural variation in producing ProTs. Drawing on appropriate narratives and metaphors, combined with contexts conducive to oneness experiences, the compassionate and altruistic side of people can be better understood and drawn upon in the pursuit of living well together.
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Chapter One

Oneness and Prosocial and Pro-Environmental Tendencies: Introduction and Broad Literature Review

One of the fundamental challenges of the human experience is to make sense of how one’s own existence relates to a broader context (Baumeister, 1991). On the scale in which we live our everyday lives, we are meaningfully distinct entities. We can be counted in a non-arbitrary way, we have a sense of internal continuity (Atchley, 1989), and a unique blend of temperaments, desires, and other characteristics that make us who we are (Allen & DeYoung, 2017; DeYoung, 2010; DeYoung, 2015). However, we simultaneously contain nested structures and are nested within larger structures, with meaningfully distinct entities at every scale (Calcott & Sterelny, 2011; J. M. Smith & Szathmary, 1997; Wilson, Van Vugt, & O’Gorman, 2008). For example, “zooming in” to scales smaller than the individual person, we are an interacting system of individual biological cells, some of which are differentiated despite having identical DNA, and some of which have different DNA (e.g., the organisms that comprise the gut biome) (Goodrich, Davenport, Clark, & Ley, 2017). Although each is an individual cell seemingly doing its own thing, whatever it is that “I” am emerges from their combined interactions. Similarly, cells are comprised of atoms, which are comprised of subatomic particles, and somewhere at the bottom of the hierarchy may be some kind of fundamental substance of existence, whatever that might be (Guth & Kaiser, 2005; Strawson, 2006). “Zooming out” to scales beyond the individual person, we can simultaneously be members of a family, a community, a society, humanity, life and nature. We are “Earthlings” (Monson, 2005), “milky-way-lings”, and “existence-lings”. The combined interactions of the entities at each level give rise to the entities at the level above.

We also have a similarly embedded existence on a temporal scale. That is, our current physical context is the product of change over time (e.g., Watson et al., 2016), and any two entities can be traced back in time to a common source. For example, siblings share parents, cousins share grandparents, all humans share a common ancestor from roughly 200-400 thousand years ago (Hublin et al., 2017); all life on Earth comes from an original source.
roughly 4 billion years ago (Mojzsis et al., 1996); and everything in the universe is the result of an unfurling of existence from a single big bang roughly 14 billion years ago (Aghanim et al., 2018). And here we are, now.

The above is just a list of examples of how we might construe our embeddedness within different spatial and temporal scales. These examples are useful for providing a general definition of what is meant by “oneness” in the current thesis. That is, oneness, in general, is a salient sense of connection between the self and an entity from a more “zoomed out” scale (a self-transcendent entity). Somewhat paradoxically, perceived connections to a self-transcendent entity can also be arrived at by “zooming in”. For example, the idea that there is a universal substance at the smallest scale also constitutes a oneness connection at the largest scale. Accordingly, oneness concepts in the literature are those that attempt to describe and measure perceived connections to these kinds of self-transcendent entities.

Given the multitude of possible self-transcendent entities that can be conceptualised, and the different forms that a “salient sense of connection” with these entities can take (i.e., belief, feeling, or experience), there are countless potential ways that people can be said to have some degree of oneness – from believing in a spiritual essence that connects all of existence, to feeling part of a natural symbiotic system, to including a close other in the self. This thesis is not concerned with the “ultimate truth” of these potential oneness connections, but rather with categorising the basic features across the range of oneness perceptions. It also does not claim that the salience of oneness levels precludes the salience of the level of the individual, nor that people necessarily ought to strive for a complete loss of salience of this individual level. Rather, it assumes that different kinds of connections to different self-transcendent entities can vary across people and context, and that a relatively high salience of such a connection (compared to a relatively low salience) may have interesting and important effects on other psychological phenomena, particularly prosocial and pro-environmental tendencies (ProTs).

The current thesis also assumes that the many and varied oneness concepts in the literature reflect and begin to categorise the variation in oneness perceptions. It proceeds on this assumption by using the existing concepts and measures as the raw materials for further categorisation of the basic elements. The oneness typology offered in the current thesis as a result of this categorisation is also statistically tested and refined using exploratory and
confirmatory factor analysis. The resulting factors are used to test for differential effects of different types of oneness on ProTs.

The introduction to this thesis is divided into three parts. The first part is a detailed exploration of the concept of oneness. In particular, the oneness typology will be outlined, although a more detailed justification of the typology and the process of its construction will be provided in Chapter 3. Concepts related to oneness (but that are not quite oneness concepts) will also be briefly discussed. This helps to further define oneness, by pointing out what it is not. Finally, possible evolutionary, developmental and neurological underpinnings of oneness will be briefly overviewed.

The second part outlines the broad concept of ProTs (prosocial and pro-environmental tendencies). This thesis is concerned not only with the categorisation of the basic elements of oneness perceptions, but also how these categories might differentially relate to ProTs. Because the literature on the relationship between oneness and ProTs uses a multitude of different ProTs, from values to attitudes, motivations, and behaviours, the concept of ProTs is established as a shorthand that can be used throughout the document. This second part of the introduction also identifies the specific ProTs that are of primary interest in this thesis, namely having a sense of intrinsically valuing the other and behaving or aspiring to behave in their interests.

The third part of this introduction outlines the existing evidence for the relationships between oneness and ProTs. Gaps in the literature that address these relationships are identified, particularly gaps that the current thesis aims to explore, which leads to a description of the importance of this thesis.

1.1 Oneness typology and related concepts

1.1.1 Oneness typology

This part of the introduction outlines the oneness typology that constitutes the main conceptual contribution of the current thesis to the literature. The process leading to its construction, a more thorough justification of its dimensions, and a discussion of its implications appear in Chapter 3. The dimensions of the typology are based on the language
used in the descriptions of the oneness concepts in the literature, and also the language used in their measures (with an emphasis on scale-based measures).

The oneness typology has three dimensions (see Figure 1.1). Figure 1.1 implies that oneness is the belief, and/or experience, and/or intuition that oneself is connected to some other via interdependence with the other, and/or sharing an essence with the other, and/or self-expansion to include the other, where the other is some self-transcendent entity at any scope. These dimensions and sub-dimensions are explained in more detail below.

Figure 1.1. The three dimensions of the oneness typology. Manifestation and psychological ontology each have three sub-dimensions, but scope is theoretically continuous.

1.1.1.1 Scope

*Scope* refers to the self-transcendent entity that the concept is concerned with. This is typically either a specific close other (e.g., Agnew, Van Lange, Rusbult, & Langston, 1998; Aron, Aron, Tudor, & Nelson, 1991), a social group (e.g., Schubert & Otten, 2002; Tropp & Wright, 2001), or a more abstract concept like humanity (e.g., Leary, Tipsord, & Tate, 2008; McFarland, Webb, & Brown, 2012; McFarland, Brown, & Webb, 2013), nature (e.g.,
Dutcher, Finley, Luloff, & Johnson, 2007; Mayer & Frantz, 2004), or all of existence (e.g., DeCicco & Stroink, 2007; Friedman, 1983; Pappas & Friedman, 2007).

1.1.1.2 Psychological ontology

Psychological ontology (PO) refers to the nature of the perceived connection to the self-transcendent entity. The language in the literature suggests there are three basic categories of PO. The first is self-expansion (expansion), in which the other entity is included in the self, thereby expanding the self (e.g., Aron et al., 1991; Aron, Aron, & Smollan, 1992; Friedman, 1983; Mashek, Cannaday, & Tangney, 2007; Pappas & Friedman, 2007; Schultz, 2002; Tropp & Wright, 2001). The second is interdependence, in which the self is seen as part of a symbiotic system from which the self-transcendent entity emerges (e.g., Agnew et al., 1998; J. L. Davis, Green, & Reed, 2009). The third is shared essence (essential), in which the self is seen as sharing some fundamental property or substance with the self-transcendent entity or its constituent parts (e.g., Dutcher et al., 2007; Garfield, Drwecki, Moore, Kortenkamp, & Gracz, 2014). You could say, contrary to the interdependence PO, that in the essential PO the self emerges out of the self-transcendent entity. Although these POs are clearly demarcated within the typology, they are not always clearly demarcated in the literature, and not many existing concepts focus solely on just one. However, a relatively “pure” concept is provided as an example for each PO below. These examples are supplemented with examples of language used in concepts that otherwise refer to multiple POs.

Expansion

A clear example of an expansion PO can be found in Friedman’s (1983) and Pappas and Friedman’s (2007) concept of self-expansiveness. They argue that there is no limit (neither temporal nor spatial) to what a person can include within their self-concept. As such, a person’s level of self-expansiveness refers to wherever one places the boundary between self and non-self. Another example of expansion can be found in Aron et al.’s (1991) concept of inclusion of other in the self (IOS), and its widely used IOS scale (Aron et al., 1992). They note that IOS was based on their self-expansion model (Aron & Aron, 1986), which holds that people seek close relationships in order to expand the self, particularly through including in the self the resources, perspectives and characteristics of another. However, they also note
that their scale, which consists of pairs of circles that become progressively more overlapped, is consistent with multiple theories about close relationships (Aron et al., 1992). At times, the language they use to describe the concept reflects this more general PO. For example, they refer to “interconnected selves” (p. 598); a “more general union of self and other” (p. 598); and simply “feeling close” (p. 605). Nonetheless, the IOS concept and its scale has inspired the development of oneness concepts with an expansion connotation for a variety of scopes, from community (e.g., Mashek et al., 2007), to ingroup (e.g., Tropp & Wright, 2001), to nature (e.g., Schultz, 2002), and much in between (e.g., Leary et al., 2008).

One common element of concepts that refer at least partly to expansion is the idea that damage to the other is seen as damage to the self. For example, Nisbet, Zilensky and Murphy (2009, p. 717) describe the concept of ecological identity as people who include nature and humanity in the self, such that “damage to the planet is seen as damage to the self”. Similarly, Naess and Drengson (2008, p. 88) note that people who identify with a place might feel that “if this place is destroyed, something in me is killed”, and inversely “if the self is widened and deepened… protection of free nature is felt and conceived as protection of ourselves”. Further, Mayer and Frantz (2004, p. 512) note that “if people feel connected to nature, then they will be less likely to harm it, for harming it would in essence be harming their very self”. Finally, DeCicco and Stroink (2007, p. 84) note that “how one contemplates world poverty may reflect the metapersonal self if world poverty is seen as one’s own poverty”. This theme of “damage to the other as damage to the self” is prevalent in the oneness literature, and was one of the key ideas that contributed to the development of the PO dimension and its sub-dimensions.

Interdependence

A clear example of an interdependence PO can be found in Davis et al.’s (2009) theory of interdependence with the environment, and Agnew et al.’s (1998) concept of cognitive interdependence on which it was based. Agnew et al. (1998) noted that our “self-in-relationship mental representations… [are restructured such that we] perceive ourselves less as individuals and more as part of a pluralistic self-and-partner collective” (p. 939). They continue by noting that this cognitive interdependence facilitates the gratification of multiple needs within the relationship, such as security and intimacy (p. 941). Similarly, Davis et al. (2009) note that “whether or not individuals feel ‘close’ or ‘connected’ to nature, they are
interdependent with nature in the sense that the well-being of nature can affect the well-being of individuals (and vice versa)”, and argue that this interdependence has important psychological consequences, particularly by creating a sense of commitment to nature.

Multiple other oneness concepts refer at least partly to an interdependence PO. For example, the Identity Fusion scale includes items that refer to being strong because of one’s country, and making one’s country strong (Swann, Jetten, Gómez, Whitehouse, & Bastian, 2012). Piedmont (1999, pp. 995-996) describes spiritual transcendence as including “a belief that one is part of a larger human orchestra whose contribution is indispensable in creating life’s continuing harmony”; and also as “a feeling that all life is interconnected and a sense of shared responsibility of one creature to another”. The Environmental Identity scale includes an item referring to seeing the self as part of an ecosystem (Olivos & Aragonés, 2011), where an ecosystem is generally defined as “the complex of a community of organisms and its environment functioning as an ecological unit”, or “something considered to resemble an ecological ecosystem especially because of its complex interdependent parts” [emphasis added] (Ecosystem.n.d). Finally, Mayer and Frantz (2004) describe connectedness to nature as including the view that one’s welfare is “related to the welfare of the natural world” (p. 505).

**Essential**

A clear example of an essential PO can be found in Dutcher et al.’s (2007) concept of connectivity with nature. They describe connectivity with nature as “a sense of shared or common essence between the self, nature, and others” (p. 474). They even explicitly distinguish it from the interdependence PO by arguing that environmental values stem from this sense of shared essence, rather than from a “material or economic basis for including people and nature in the same community” (p. 479). Another clear example of the essential PO can be found in Garfield et al.’s (2014) Oneness Beliefs scale, which measures belief in a shared spiritual essence using items such as “a vital thread of life joins all objects and beings in the universe”, and measures belief in a shared physical essence using items such as “all parts of the universe – both living and nonliving – are composed of the same fundamental materials” (p. 360).

Language that implies an essential PO is also present in many other oneness concepts and measures. For example, DeCicco and Stroink (2007, p. 84) describe the metapersonal
self-construal as a self-representation that refers to “an essence beyond the individual and others to a universal focus”. Bragg (1996, p. 96) describes an ecological identity as including an understanding that “we and all other entities are aspects of a single unfolding reality”. Concepts like a “shared life force” or a “unifying force” (e.g., Garfield et al., 2014; Mayer & Frantz, 2004) and kinship/family (e.g., Gómez et al., 2011; McFarland et al., 2012; McFarland et al., 2013; Schultz, 2002; Swann et al., 2012) are also present and refer to a shared essence of some kind.

1.1.1.3 Manifestation

Manifestation refers to the psychological domain that contains the oneness information. The manifestation dimension consists of three sub dimensions: experiences, beliefs, and feelings.

Experiences are pre-interpretive, fleeting feelings of oneness that are typically hard to describe, but whose description tends to use metaphorical, poetic language to convey a sense that the self has diminished and merged into, or somewhat paradoxically become, something larger. Examples include mystical experiences (Hood, 1975; MacLean, Leoutsakos, Johnson, & Griffiths, 2012), and spiritual experiences (MacDonald, 2000a; MacDonald, 2000b).

Beliefs are propositions about the world that are taken to be true. Examples include the Oneness Beliefs scale, and any item in a oneness measure that is phrased as a statement of fact, such as those that begin with “I am”. For example, “I believe that on some level my life is intimately tied to all of humankind” (Piedmont, 1999, p. 996), “I believe that the well-being of the natural environment can affect my own well-being” (J. L. Davis et al., 2009, p. 179), and “Ultimately, I am related to trees” (St John & MacDonald, 2007, p. 54).

Feelings refer to intuitive senses of oneness that are not outright beliefs. Items that measure oneness feelings may begin with “I feel that”. In this sense they are like experiences, but they are longer lasting, and can contain more specific content. Examples include the “intuitive sense of sameness” central to Dutcher et al.’s (2007, p. 479) connectivity with nature, and the “visceral feeling of ‘oneness’ with the group” in Swann et al.’s (2012, p. 52) identity fusion.

The word “feeling” does not in this case refer to emotions. Emotions are internal affective states (Ortony, Clore, & Foss, 1987), while feelings of oneness are more cognitive
than affective. For example, when drunk on alcohol, it can feel as though the room is spinning. This is not an emotion, nor does it represent a belief that the room is spinning, but instead it is a feeling or sense that the world is a particular way at that moment. This is the general type of feeling that is here combined with senses and intuitions under the feeling manifestation of the typology.

On comparing these three manifestations to the commonly applied psychological tripartite model of cognition, behaviour, and affect, it is apparent that behaviour and affect are notably absent (e.g., Breckler, 1984). This is because the oneness typology is designed to distinguish between consciously accessible construals of how one is connected to self-transcendent entities, rather than their associated emotions or behaviours. In the oneness typology, cognitions are divided into beliefs and feelings, while experiences are added as a relatively common means by which people encounter some sense that they are connected to self-transcendent entities.

The relationship between the three manifestations

The distinction between beliefs and feelings is inspired by Perrin and Benassi’s critique of Mayer and Frantz’s (2009) Connectedness to Nature scale (CTN scale). Perrin and Benassi argued that the CTN scale measures cognitions of connection to nature, rather than affective/emotional connection to nature. While this critique might be correct, it could be argued that Mayer and Frantz’s (2004) intention was to measure an intuitive/felt connection to nature, rather than emotions per se. This intuitive/felt connection would be longer lasting than a fleeting experience, and would not necessarily constitute an explicit proposition about the world. The feeling manifestation seemed an appropriate category to capture this area between fleeting experiences and beliefs.

Although the three manifestations are presented as existing on the same level, Chapter 5 of the present thesis explores the possibility that general oneness experiences are a source of more specific oneness beliefs and feelings, thereby implying that experiences act at a different, more fundamental level than the other two manifestations. The assumption of the present thesis is, therefore, that oneness experiences, in their pre-interpretive state, are relatively similar across people and time/context (Z. Chen, Qi, Hood, & Watson, 2011; Z. Chen, Hood, Yang, & Watson, 2011; Hood, 2006). It is how the experience is interpreted in light of pre-existing knowledge and world views that determine which of the psychological
ontologies (POs) the experience will go on to create or reinforce. If so, oneness experiences should predict all three of the POs, which is a hypothesis tested in the study presented in Chapter 5.

In line with this, Yaden, Haidt, Hood Jr, Vago, and Newberg et al. (2017) noted that “how one’s belief-based interpretation of their STE [self-transcendent experience] influence its effects” (p. 149) is an area for future research. Although it is noted that research is required, the hypothesis that oneness experiences can be interpreted through multiple perspectives is already alluded to in the literature. For example, Garfield et al. (2014) noted that both spiritual and physical oneness beliefs were significantly correlated with mystical experiences, suggesting that mystical experiences may be interpreted meaningfully both by people who are spiritually minded and people who are more physically minded. Similarly, Hall-McKane (2014, p. 57) noted that Hood’s (1975) Mysticism scale captures experiences that can be interpreted in different ways. In particular, they can be interpreted through intuitive understandings arrived at via introspection and/or symbols provided by more structured belief systems like religions, and/or knowledge about the world provided by science. The resulting interpretations might be classified as spiritual, and/or religious, and/or secular. Finally, a study by Van Cappellen & Saroglou (2012) found that pre-existing values and levels of spirituality influenced how awe experiences were interpreted. Producing changes in the salience or content of beliefs and feelings about the three POs therefore represents an avenue for oneness experiences to exert an influence beyond the timeframe of the transient experience itself. In other words, oneness beliefs and feelings might be thought of as influential souvenirs of experiences.

1.1.1.4 Room for conceptual clarification in the literature

As will be elaborated in Chapter 3, the majority of measures associated with the various oneness concepts in the literature do not adequately distinguish between the three types of PO in the typology. In particular, most of them refer to more than one PO, either because they include items that are sufficiently vague as to relate to more than one PO (for example, using general words like “oneness” and “connection”, or pictorial measures like the Inclusion of Other in the Self scale (Aron et al., 1992)); or because they include a range of items that refer to different POs. The manifestation dimension is less problematic. There are a number of measures that isolate the experience manifestation (Hood, 1975, e.g.; MacDonald,
(2000a; MacLean et al., 2012; Yaden et al., 2017). However, there is a tendency for non-experience measures to include either a combination of belief and feeling items, or items that do not belong to either manifestation, such as those referring to emotions or behaviours (as shown in Chapter 3). The scope dimension is the least problematic, with most measures seeming to have relatively well-defined scopes, and those that span multiple scopes do so explicitly (e.g., Leary et al., 2008).

The scarcity of measures that validly isolate a specific aspect of the oneness typology could be owing to one of two reasons. 1) The theoretical background of a measure may explicitly isolate a specific aspect of the oneness typology, but the measure does not have good apparent content validity of that type of oneness. The lack of content validity might be owing to items that specifically refer to different types of oneness, or items that refer to more general types of oneness that could tap multiple different types of oneness. 2) The theoretical background of a measure contains references to multiple sub-dimensions of the typology (whether intentional or not), but the measure does not represent these sub-dimensions with a sufficient number of items arranged into appropriate subscales, and/or it contains items that refer to more general types of oneness.

Nonetheless, there are two notable exceptions that explicitly position themselves on all three dimensions of the typology. One is Garfield et al.’s (2014) Oneness Beliefs scale, which measures the belief manifestation of an essential PO with all of existence. The other is Dutcher et al.’s (2007) Connectivity with Nature scale, which measures the feeling manifestation of an essential PO with nature. However, even with these two examples in mind, no attempt has been made to distinguish between the three POs and manifestations for a given scope in a unified set of subscales. The current thesis represents an initial attempt at doing exactly that, allowing the distinctiveness of the dimensions and sub-dimensions to be statistically tested via factor analysis.

**Additional notes related to scope**

Because there are potentially an infinite number of possible scopes of oneness, in this thesis only two are focused on: nature and humanity. These two are appropriate for three reasons. 1) They are already present in the oneness literature, with measures referring to oneness with nature (e.g., Dutcher et al., 2007; Schultz, 2002; Schultz, Shriver, Tabanico, & Khazian, 2004; Tam, 2013), with humanity (e.g., McFarland et al., 2012; McFarland et al.,
2013), and one measure even distinguishing between the two (Leary et al., 2008); 2) they exist at the same general level as the wide-reaching ProTs that are of interest to this research (i.e., more general prosocial and pro-environmental tendencies); and 3) they are relatively large, and these larger scopes may be more conducive to oneness. To expand on point 3, if oneness beliefs and feelings are conceptualised as having a potential root in profound oneness experiences, and profound oneness experiences are typically associated with a breaking down of boundaries, then these experiences are expected to be more conducive to the formation of oneness beliefs and intuitions related to more abstract, less bounded entities. Nature and humanity would therefore seem to be more appropriate than more bounded entities, such as a nation or particular social group.

Nonetheless, despite the possible tendency for oneness to “collapse” to the larger extreme of the scope dimension, it is acknowledged that people can believe or intuit oneness connections with smaller scopes. A particularly prevalent and strong example is the oneness between partners in intimate relationships or between parent and child. Interestingly, the more intermediate scopes (i.e., those in between one-on-one relationships and all-encompassing entities) seem to contain examples of oneness with more negative connotations. For example, tribalism, religious extremism, and patriotism lead to an “us” vs “them” mentality, which may be associated with ProTs towards one group, but at the cost of hostility towards another group (Swann et al., 2012).

1.1.1.5 Summary of the main claims to be defended so far

So far, two main claims have been established that are explored and defended throughout the thesis. They are noted here for clarity.

1) The oneness typology is a useful way of conceptualising different types of oneness, where useful means:
   a. providing conceptual clarity
   b. being supported statistically
   c. generating interesting and novel predictions

2) Oneness experiences can create or reinforce beliefs and feelings about the three POs for the two broad scopes of humanity and nature. As such, they represent a potential source of oneness beliefs and intuitions for people with a range of world views and perspectives.
1.1.2 Concepts related to oneness that are not quite oneness

The oneness typology is a way of organising key themes that appear across a range of concepts in the literature. Concepts can align with these themes to greater or lesser extents, resulting in some concepts that clearly count as oneness concepts, some that clearly do not, and some that occupy a grey area in the middle. This section describes some common concepts that are related to oneness, but that have key themes that do not sufficiently fit within the dimensions of the typology for the concepts to count as oneness concepts per se. Explaining how they do not quite fit is useful for continuing to establish what the typology is referring to. For this reason, attention is focussed on concepts whose exploration is particularly useful to clarifying the oneness typology, rather than outlining all related concepts. The main concepts addressed in this section are interdependent/independent self-construal; collectivism/individualism; identity vs identification; implicit association between self and other; awe; and self-transcendence.

1.1.2.1 Interdependent/independent self-construal

Interdependent self-construal (Markus & Kitayama, 1991; Singelis, 1994) is not quite a oneness concept, despite sharing the “interdependent” label with one of the POs in the typology, and sharing the “self-construal” categorisation of another concept that is considered a oneness concept (i.e., metapersonal self-construal (DeCicco & Stroink, 2007)). Interdependent self-construal refers to the tendency for people to define the self in terms of their relationships with others (either in close interpersonal relationships or larger social groups (Cross, Bacon, & Morris, 2000), but it does not specify (or sufficiently emphasise) that the basis for this relationship is conceived as self-expansion, interdependence, or shared essence. For example, one of the defining characteristics of an interdependent self-construal is using social roles to describe the self, which is contrasted with an independent self-construal in which people tend to describe themselves using personal attributes. DeCicco and Stroink (2007, p. 89) uses “I am a mother” and “I am a professor” as examples of construing the self through social roles (i.e., interdependent self-construal); and “I am strong” and “I am thoughtful” as examples of construing the self using personal attributes (i.e., independent self-construal). Taking the example of “mother” as a description of the self that is centred around a social role, defining oneself as a mother is different (or at least less specific) than the following examples of a mother’s oneness perceptions with her child: having an
experience where one seemed to merge with their child; including the child in the self; having a strong sense that they share an essence with the child; or believing that one forms a symbiotic relationship with the child.

It may be that people who tend to have these kinds of oneness perceptions with their child also have a more salient self-categorization as a “mother” than they would otherwise. It also may be that someone who defines themselves as a mother has a sense of losing part of their self when losing their child even without including the child in the self, because losing the child may represent losing the role of mother, and therefore losing a salient category applied to the self. However, tendencies for self-categorization are not perceptions of oneness per se, even though they may be correlates of oneness. Further, interdependent self-construal also refers to behavioural tendencies, such as giving up a seat for someone with higher status; and values, such as respect for authority. Again, behaviours and values are not perceptions of oneness in and of themselves, even though they may be correlates.

Metapersonal self-construal is an exception within the broader construct of self-construal. Although DeCicco and Stroink (2007) conceptualised metapersonal self-construal as just a more expansive type of self-construal than interdependent and independent, it is also described in a way that implies a qualitatively different type. That is, metapersonal self-construal places an emphasis on oneness concepts, such as inclusion of other in the self and shared essence. Therefore it not only applies to entities beyond one’s society, but it also refers to being connected to these entities in ways consistent with the oneness typology.

1.1.2.2 Collectivism/individualism

One way of thinking about collectivism and individualism (Triandis, Bontempo, Villareal, Asai, & Lucca, 1988; Triandis, 2018) is that they are the cultural-level manifestation of individual-level self-construals (and vice versa – that collectivism and individualism are the cultural pattern that emerges from self-construal tendencies across individuals in that culture) (Cross, Hardin, & Gercek-Swing, 2011; Singelis, 1994). That is, collectivist societies are those that are comprised of people with predominately interdependent self-construals, while individualist societies are those that are comprised of people with predominately independent self-construals. Oneness, somewhat ironically, is an individual-level characteristic, not a cultural-level one, even though it may be correlated with various cultural-level characteristics. For example, it may be that people in collectivist
societies tend to have higher degrees of oneness with others from their ingroup, perhaps as a result of, for example, cultural narratives that emphasise the importance of banding together, or normalised patterns of behaviour that, through repetition, lead to inclusion of other in the self. Conversely, individualism may be associated with some types of oneness, given that individualism is associated with concepts like universal human rights and the inherent value of each individual. Nonetheless, the concepts of collectivism and individualism describe tendencies at the cultural rather than the individual level, so they do not count as a oneness concepts.

1.1.2.3 Identity vs. identification

Multiple specific concepts draw on the two broader concepts of identity and identification. It is not always made explicit how the two differ, and it seems the terms are sometimes used interchangeably (e.g., Reese et al. (2015) use identification to refer to self-categorisation, which is in the realm of identity). However, for the purposes of the present thesis, the distinction made by Tropp & Wright (2001) is followed. They wrote that “unlike the broader collective identity [approach]… we emphasize the degree to which a specific ingroup is part of the person’s self-representation, not the tendency to define oneself in terms of group memberships on a more general level” (p. 587). Similarly, Cloninger et al. (1993) wrote that “self-transcendence refers generally to identification [emphasis added] with everything conceived as essential and consequential parts of a unified whole”, which they note involves “a state of ‘unitive consciousness’ in which everything is part of one totality… [and in which] there is no individual self because there is no meaningful distinction between self and other – the person is simply aware of being an integral part of the evolution of the cosmos” (p. 981). Finally, Naess and Drengson (2008), on the concept of an ecological self, wrote that “the ecological self of a person is that with which this person identifies” (p. 84), where they describe identification is a non-basic form of intense empathy in which one sees themselves in the other. They elaborated on the concept of identification by noting that, through identification, “one’s own interest are served by conservation, through genuine self-love, the love of a widened and deepened self” (85).

According to these descriptions, identification is more aligned with the oneness typology than is identity, as identification tends to be described in terms of inclusion of other in the self, while identity describes a more superficial phenomenon of self-categorization. In
other words, identification refers to identifying with while identity refers to identifying as. In practice, the two may often be related. For example, identifying with all of humanity might make one more likely to identify as “human”. Nonetheless, the conceptualisation of how one is fundamentally connected to the category in question is where the potential oneness concept is to be found, not in the self-categorization itself.

1.1.2.4 Implicit association between self and other

Implicit association tests (IATs) have been used to support multiple oneness concepts, particularly ones centred around inclusion of other in the self (Aron et al., 1991; Schultz et al., 2004). IATs use reaction time paradigms in which words are categorised as quickly as possible to test the extent to which self-related words are entangled with words related to a given other, thereby reflecting an entangling of the self-concept and the concept of a given other. While self-report measures of oneness (i.e., explicit associations between self and other) tend to correlate with implicit associations, the oneness typology only focuses on explicit associations (i.e., consciously accessible construals of how one is connected to the other). Such a focus is for two reasons. 1) One of the main purposes for creating the typology was to provide a more detailed understanding of the multidimensionality of oneness. Implicit associations could reflect multiple explicit or implicit relationships between self and other, for example, sharing a salient category with the other, inclusion of other-concept in the self-concept, inclusion of self-concept in the other-concept, or inclusion of self and other in a transcendent concept. IATs are therefore not able to make the kinds of distinctions the typology was designed to make. 2) The typology is based on language used across the related concepts and measures in the literature. Focussing on concepts that have self-report scales therefore provided the necessary words/data to construct the typology. Nonetheless, it would be interesting to test whether the three different types of PO outlined in the typology are indeed correlated with implicit associations with the other entity. This can be an area for future research.

1.1.2.5 Awe experiences

Awe experiences are defined as comprising two components: 1) the sense of a diminished self in the presence of vast stimuli; and 2) the motivation to act in the interest of others (Piff, Dietze, Feinberg, Stancato, & Keltner, 2015). However, they are not
conceptualised as containing a component of connection to the self-transcendent entity that provided the context for the self-diminishment. This can be contrasted with, for example, mystical or spiritual experiences which are characterised partly by a merging or extending of the self into the larger entity (MacDonald, 2000a; MacLean et al., 2012). Nonetheless, oneness and awe may be closely related, or may often co-occur, as the self-diminishment that characterises awe experiences may also provide a context conducive to feeling or conceptualising how the small self is connected to the large other.

1.1.2.6 Self-transcendence

Yaden et al. (2017) categorise awe experiences as self-transcendent experiences. Self-transcendence is another concept that appears frequently in the oneness literature, yet it is not always clear exactly what it refers to. Distinctions can be made between self-transcendent values, self-transcendent experiences, and perceived connection to self-transcendent entities. Self-transcendent values are those characterised by a fundamental motivation to help entities other than the self, e.g., universalism and benevolence (Schwartz, 1992). Self-transcendent experiences are those in which self-awareness momentarily diminishes to basically nothing, e.g., flow experiences and awe-experiences (Yaden et al., 2017). Finally, self-transcendent entities are conceptually meaningful entities that are larger than the self; and particular types of perceived connection to such entities constitute oneness as defined here.

1.1.2.7 Summary

The related concepts outlined above share with oneness concepts the idea that the self, generally defined, is a variable construct. Explaining how they are not quite oneness concepts helps to demarcate the subset of this general idea that the oneness typology captures.

1.1.3 Neurological, developmental, and evolutionary perspectives

The concept of oneness can be further elucidated by considering it from evolutionary, developmental, and neurological perspectives. These can be thought of as representing three nested time-scales. From the present (neurological), to the lifespan (developmental), to the inter-generational (evolutionary).
1.1.3.1 Neurological

The literature on the neurological underpinnings of oneness tends to focus on the experience manifestation of oneness, often experimentally induced by practices such as meditation, or by the administration of psychedelic substances like psilocybin. The neurological correlates mentioned in this section therefore only relate to the experience manifestation in the oneness typology, and not the belief or intuition manifestations.

Perhaps one of the more interesting findings from this literature is that the neural correlates of naturally occurring oneness experiences are roughly the same as those for drug induced ones. For example, both meditation and psychedelic drugs inhibit thalamic regions, which may reduce neural flow to parietal regions (Newberg & Iversen, 2003; Newberg et al., 2001). These parietal regions show decreased activity for meditators and nuns who experienced a strong sense of oneness during scanning (Newberg et al., 2001), and are involved in awareness of self in space, and self in comparison to non-self (Farrer & Frith, 2002; Newberg & Iversen, 2003; Newberg et al., 2001). Similarly, reduction in this parietal activity has also been associated with mystical experiences (Azari et al., 2001; Beauregard & Paquette, 2006; Johnstone, Bodling, Cohen, Christ, & Wegrzyn, 2012), and such disruptions in parietal regions predispose people to self-transcendent experiences (Urgesi, Aglioti, Skrap, & Fabbro, 2010). Finally, Winkelman (2017) also proposed similarities between the oneness experiences encountered through psychedelic drugs and non-drug causes like meditation. They argued that both causes disrupt the “default mode network” (of which inferior parietal cortex is a part), which represents a disruption in important self-functions, in turn allowing for the characteristic sense of unity and connection with everything.

Taken together, the parietal cortex and aspects of the default mode network seem to be implicated in oneness experiences. Further, the finding that similar patterns of activity (or reduction thereof) occur for drug-induced and non-drug induced oneness experiences supports the hypothesis that oneness experiences, in their pre-interpretive state, are relatively similar across people and occurrence (e.g., Z. Chen et al., 2011; Hood, 2006). It also suggests that there are multiple means by which to foster similar oneness experiences.

1.1.3.2 Developmental

Oneness can also be understood in a developmental context, particularly as representing a mature perspective on the relationship between self and other. The general
developmental trajectory could be conceptualised as beginning with a basic form of oneness in infants, to separation, to a return to oneness, but of a more sophisticated and mature type than that in infancy.

Oneness, as defined by the typology, requires a relatively mature perspective on one’s place within the context of larger entities. Firstly, if it is accepted that the psychological ontologies (POs) are meaningfully distinct, then they are differentiated by relatively nuanced distinctions. Secondly, the self-transcendent entities (scope) are often abstract (e.g., nature) and therefore require relatively sophisticated mental processes to conceptualise. Finally, the combinations of the POs and different scopes often require specific knowledge (particularly in the case of an interdependence PO, e.g., knowing about the ways in which one is symbiotic with nature, or knowing about the big bang, or the creation stories etc.), or the use of abstract metaphors. Oneness experiences are an exception to this requirement of more nuanced understandings, because they can likely spontaneously occur or be induced in anyone. However, the way oneness experiences are operationally defined does require an ability to interpret them with, again, abstract metaphors. Oneness, as conceptualised here, is therefore something over and above the inability to differentiate self from other in infancy. Some examples of this general developmental trajectory are provided below.

Krebs and Van Hesteren (1994, p. 120) posit an eight-stage development of altruism that can be taken to inform the development of oneness. They note on pages 120-121 that in Stage 0, the self is “undifferentiated from others”, and has a “tendency to feel overt signs of affect in others”. Hoffman (1981) similarly notes that self and other are indistinguishable in infancy, and Piliavin and Charng (1990) notes that this leads to emotional contagion when the other feels, for example, distress. Stages 1-5 of Krebs and Van Hesteren’s (1994) developmental model track the process of separation as the motivation for prosocial behaviour transitions from alleviating vicarious distress, to expecting reciprocity, to acting in accordance with internalized moral principles. Finally, Stages 6 and 7 are characterised by the transcendence of the self-other dichotomy, first by acting in accordance with humanitarian principles, and then acting from a “cosmic feeling of oneness [emphasis added] with the universe, identification with the species, [and] active compassion for a commonwealth of beings. Although Krebs and Van Hesteren do not offer age ranges for these stages, on page 114 they roughly align their developmental levels of altruism with Piaget’s (1964) stages of development, which do have associated age ranges. Based on this alignment, stage 0 altruism co-occurs with Piaget’s sensorimotor stage from birth to 24
months; stage 1 altruism co-occurs with the Piaget’s preoperational stage from 2 to 7 years old; stage 2 altruism co-occurs with Piaget’s concrete operational stage from 7-11 years old; stage 3-4 altruism co-occurs with Piaget’s formal operational stage from adolescence to adulthood. Stages 6-7 altruism, with their oneness component, would therefore not be expected in adolescents and children.

In another example, Friedman & Pappas (2006) outline the concept of self-contraction as a complementary aspect of Friedman’s (1983) concept of self-expansiveness. While self-expansiveness takes the default position of a contracted self that has the potential to expand, self-contraction takes the default position of a boundless self that has, as they put it, the “potential for immanence”, in which they define immanence as the opposite of transcendence (p. 49). The development from infant oneness to the sense of a personal self can be thought of as an initial attempt to create a sense of immanence from a default state of expansion, and a more mature oneness can be thought of as a re-expansion. However, it is conceivable that in some contexts, the initial creation of immanence is guided by culture such that it results in a more mature expanded self without first going through a period of strong contraction.

A developmental perspective on oneness can also be gleaned from Kaufman’s (2018) recent analysis of Abraham Maslow’s (1943) theory of human motivation. Kaufman (2018, p. 3) noted that after people’s basic physical needs are satisfied, and therefore they are no longer motivated by the perceived deprivation of these needs, they can become motivated by the perceived potential flourishing from pursuing “exploration, creativity, and love for all humankind [emphasis added]”. Similarly, McFarland et al. (2012, p. 831) note that “Maslow’s concept of ‘self-actualized individuals’… also embraces identification with and concern for all humanity… [and that self-actualized people] exhibit “human kinship”’. Self-actualization is therefore the pinnacle of human development, and it contains a significant oneness component. Indeed, Kaufman (2018) found a significant positive relationship between self-actualization and the unity subscale of the self-transcendence scale developed by Yaden et al. (2018), supporting the close relationship between the two constructs.

It is interesting that the phrase self-actualization and self-transcendence appear to be at odds with each other. How can the self be “actualised” and “transcended” at the same time? One solution is to conceive of an actualised self as one whose “true nature” is revealed. There may be no better way of understanding the nature of something than understanding its place within larger contexts. For example, understanding the self as an integral part of a
natural or human system. Such an understanding is, in essence, a form of self-transcendence or oneness.

These examples show, in multiple theories, a similar trajectory from basic undifferentiation in infants, to establishing a sense of the individual, to returning to oneness with a more mature perspective. Although there seems to be this general trend, the more specific nature of the trajectory after undifferentiated oneness in infancy might depend partly on contextual factors, like culture, life experiences and family dynamics. For example, in a highly individualistic culture, people might spend a substantial number of years developing a strong sense of separateness before discovering a perspective that begins to turn them outwards again. Conversely, in cultural contexts with world-views or knowledge containing more explicit oneness narratives, a more mature outward orientation may be facilitated more easily or at a younger age, perhaps even without going through as stark a period of separation. Cross-cultural perspectives are discussed in depth in Chapter 6.

1.1.3.3 Evolutionary

In a famous essay, Theodosius Dobzhnasky (1973, p. 125) asserted that “nothing in biology makes sense except in the light of evolution”. While the present thesis is situated within psychology and not biology, oneness experiences, beliefs, and intuitions are all taken to manifest in the brain’s biology using structures that have an evolutionary lineage, and to be reinforced by cultural norms and institutions that also have an evolutionary lineage. Oneness, therefore, must be at least reconcilable with if not explained by evolutionary theory.

In outlining some of the ways in which oneness makes sense in an evolutionary context, the distinction between ultimate and proximate causes is useful (Laland, Sterelny, Odling-Smee, Hoppitt, & Uller, 2011; Mayr, 1961). The ultimate cause refers to how a particular phenomenon persists or becomes more prevalent on an evolutionary time scale (i.e., over multiple generations). The proximate cause refers to how a particular phenomenon is brought about in the moment. The proximate cause itself also has an ultimate cause that overlaps with that of the phenomenon in question. Take sexual desire as an example. The ultimate cause is that it increases reproductive success (before modern medical technologies it was probably necessary for reproductive success). The proximate cause is that sex is pleasurable and intrinsically compelling in some way. Lust is usually not motivated by the thought “I really feel like having offspring right now”, even if that is its purpose on an
evolutionary time scale. Similarly, oneness may be understood as a proximate mechanism for promoting behaviour that was adaptive across a relevant portion of our evolutionary history.

The picture is complicated for human behaviour, because cultural factors, like norms and practices, can co-opt evolved tendencies and prompt them in evolutionarily novel contexts (e.g., Burnham & Johnson, 2005). This can make it hard to trace the evolutionary lineage of current patterns of behaviour. For example, assuming for a moment that a sense of oneness in relation to close others is one of the proximate causes of helping perceived kin (and helping perceived kin is evolutionarily advantageous because it increases inclusive fitness), then stories or rituals that facilitate a sense of closeness with strangers would be co-opting a mechanism that evolved through kin selection in small groups and applying it to non-kin in huge groups. Cultural factors, such as stories and rituals that promote closeness, are also subject to evolutionary pressures, which interplay with genetic evolution over time, creating a complex gene-culture co-evolutionary process. With these concepts in mind, this section will merely signpost some ways in which oneness can be understood in light of evolutionary theory.

There are two main themes in the literature that address the evolution of oneness beliefs and feelings. One centres on the potential for oneness to facilitate group cohesion, which was arguably more adaptive in an evolutionary environment in which some groups were less cohesive (Sober & Wilson, 1999; Swann et al., 2012). That is, the capacity for oneness was “selected for” at the group level because it promoted behaviour that made the group more successful in evolutionary terms than other groups. In this scenario, oneness would be one of the proximate causes of group cohesion, while the pattern of cohesive groups persisting or proliferating to a greater extent than non-cohesive groups over evolutionary time would be the ultimate cause.

One could ask, as Sober and Wilson (1999, p. 326) did, “if group selection favours the evolution of various forms of cooperative behaviour, and the proximate mechanism that produces these behaviours is the organism’s beliefs and desires, what types of [beliefs and] desire[s] should we expect the organism to possess?” The answer would include a cluster of beliefs and desires, of which a plausible member is the ability to have a sense of oneness with one’s perceived group. Another plausible member is our “instinctive desire to connect with others” (Mashek et al., 2007, p. 257), which would be served by oneness beliefs and feelings. Yet another is some tendency to distinguish between group and non-group, so that the helpful
behaviour bolstered by the sense of oneness is directed to the relevant others. Perceived similarity may provide this function by serving as a cue to (or “tag” of) kinship (Antal, Ohtsuki, Wakeley, Taylor, & Nowak, 2009; Riolo, Cohen, & Axelrod, 2001), or through the meta-contrast principle, in which a group of individuals is more likely to be perceived as an entity (or group) in its own right when those individuals are perceived to be more similar to each other than to individuals from other groups (Turner, Hogg, Oakes, Reicher, & Wetherell, 1987). Further, perceived similarity may promote both oneness cognitions (Cialdini et al., 1997; E. R. Smith, Coats, & Walling, 1999) and prosocial behaviour towards likely members of the same group (Antal et al., 2009; Oveis, Horberg, & Keltner, 2010; Riolo et al., 2001).

The other main theme is the potential for oneness to facilitate helpful behaviour towards close kin (as opposed to larger groups), such as the protective and nurturing behaviour that emerges from the close bond between parent and offspring. In this scenario, oneness would be one of the proximate causes of a parent’s protective and nurturing behaviour toward their offspring, and the pattern of people with close parent-child bonds proliferating to a greater extent than people with less of this tendency would be the ultimate cause. Multiple theorists have placed the evolutionary origins of altruistic motivations and senses of oneness in the parent-child bond (e.g., Batson, 2011; Naess & Drengson, 2008; Sober & Wilson, 1999). For this to work, the experience of oneness would need to eventually be able to be extended to others outside of that parent-child relationship.

These two themes (kin selection and group selection) are not mutually exclusive. As Marshall (2011) points out, group selection and kin selection are formally equivalent, meaning that they are a description of the same fundamental process, albeit at different scales. In addition, the two examples might be causally connected. That is, the parent-child bond may have been the initial evolutionary context for the capacity for oneness, which could then have been co-opted by cultural factors that promoted the extension of this capacity to larger groups. Swann et al. (2012) made this argument when they noted that extended identity fusion, in which people feel a sense of oneness with large groups like nations, involves a sense of shared essence that evolved to apply to close kin yet has been co-opted by cultural factors to apply even between group members who have never met.

Regarding oneness experiences, they might have served as a reinforcer of oneness beliefs and feelings. That is, the ability to have oneness experiences during, for example,
practises like meditation or religious rituals, may have created or bolstered longer lasting oneness beliefs and feelings, which may have promoted the adaptive group- or kin-directed behaviour outlined above (Fiske, 1992; Haidt, 2012; Swann et al., 2012; Winkelman, 2017). Haidt (2012) suggested that the initial ability for oneness experiences themselves might have been a neurological accident. Alternatively, Winkelman (2017) argued that oneness experiences co-evolved with psychedelic drug use (particularly “magic mushrooms”), which not only fostered social cohesion but also may have helped to facilitate the formation of our symbolic mind.

Taken together, the capacity for oneness beliefs/feelings and experiences is not only reconcilable with evolutionary theory, but there are multiple (arguably interlinked) plausible ways by which it may have been positively selected for. Both accounts (the bond between close kin, and the group-selection accounts) hold oneness (albeit with different scopes) as a proximate cause of helpful behaviour, which conferred adaptive benefits to one’s own offspring or to the group to which one belongs. Oneness experiences similarly may have bolstered group cohesion, in addition to reinforcing longer lasting oneness beliefs and intuitions. Cultural norms and practices may have co-opted these capacities for oneness, facilitating their extension to more distant kin that otherwise might have formed an outgroup in our evolutionary past.

Interestingly, this evolutionary account relies on a close relationship between oneness and prosocial tendencies – oneness being the proximate cause of the prosocial tendencies in a context in which these tendencies were evolutionarily adaptive. One of the main goals of the current thesis is to explore the relationship between oneness and prosocial and pro-environmental tendencies (ProTs), albeit in the present time scale rather than the evolutionary one. The concept of ProTs is outlined in the next section.

1.2 ProTs: Prosocial and pro-environmental tendencies

The current thesis has two main themes. The first has already been outlined in the previous section, namely the establishment of the oneness typology as a way of contributing to the understanding of the oneness concept. The second is to test for the extent to which different types of oneness in the typology differentially predict prosocial and pro-environmental tendencies (ProTs). This section outlines what is meant by ProTs and
identifies which ProTs are of particular interest in the present research. After describing the concept of ProTs, the next section will look at existing evidence for the relationship between oneness and ProTs, which leads into justifications for the specific hypotheses tested throughout the current thesis.

ProTs is used as shorthand throughout this thesis to refer to any aspects of the cluster of psychological phenomena that describe a disposition towards caring deeply about and acting in the interest of other people or the environment. ProTs capture concepts such as values, aspirations, motivations, attitudes, and behaviours. As a cluster, they comprise what one might call an outward orientation, in which the immediate or narrow self is not the only object of concern. The use of such an overarching category accounts for the range of ProTs that have been studied as downstream effects of various oneness concepts.

Here a brief description of the main aspects of the ProTs cluster is provided. Values and aspirations are discussed under their own heading; as are emotions, attitudes, and behaviours. The concept of altruism is also discussed, which includes a discussion of motivations and the concept of intrinsic value, which will be distinguished from intrinsic values.

1.2.1 Values and aspirations/goals

Broadly speaking, values are the general goals/orientations/motivations an individual holds that shape more specific goals, attitudes, and motivations (Dutcher et al., 2007; Kasser, 2011a; Schwartz, 2012). Different attempts to organise various values into their main clusters have found similar results, with clusters representing broad motivations to help others (intrinsic goals (Grouzet et al., 2005), self-transcendent values (Schwartz, 2012)) and broad motivations to help/develop the self (extrinsic goals (Grouzet et al., 2005) and self-enhancement values (Schwartz, 2012)).

Some research has focussed on more specific subsets of values. For example, environmental values refer to an orientation towards protecting the environment (Dutcher et al., 2007). Treating environmental values as its own category allows for an understanding of people who place particularly high importance on environmental protection as a motivational force in their lives.
Values can be conceptualised as forming a hierarchy (Schwartz, 2012), in which some are more foundational than others. The most foundational values are terminal values (Rokeach, 1973), which refer to desired end states, like world peace, inner harmony, and true friendship. Nonetheless, values (whether terminal or wherever in the hierarchy) that fall under the category of ProTs are those that orient people outwards, and provide a general motivational force to protect or minimise harm to other people, animals, or the environment.

A concept similar to values is environmental concern (Schultz, 2001). Environmental concern, as measured by Schultz, reflects the underlying motivations for being concerned about environmental problems. If someone is concerned about environmental damage because it harms other life forms, then they have a biospheric concern; if they are concerned because of the effects to other people, then they have an altruistic concern; finally, if they are concerned because of the effects to the self, then have an egoistic concern. The types of concern one holds is a reflection of one’s values. For example, biospheric concern represents a general motivational force in one’s life is to protect the environment and other life forms (i.e., that one has pro-environmental values). It also reflects that the person is concerned about environmental damage because of effects to aspects of the environment itself. This is an example of intrinsically valuing something (discussed in the section on altruism).

Egoistic concern highlights an interesting point about ProTs. That is, if one is motivated to protect the environment because they are only worried about themselves, then the specific motivation to protect the environment is a ProT, while the values/concern that underlie it are not. This suggests that specific aspects of ProTs do not necessarily qualify as a more general “outward orientation” on their own. Rather an “outward orientation” would be characterised by having ProTs across a range of levels (from values to motivations to behaviours).

A final concept related to values is aspirations. Aspirations are similar to values but are more specific. The Aspirations Index was devised to distinguish between intrinsic and extrinsic aspirations (Kasser & Ryan, 1993; Kasser & Ryan, 1996; Ryan et al., 1999). Intrinsic aspirations include relatedness and community. These directly reflect the basic human needs of relatedness and belonging, and are aligned in general with self-transcendent values (Grouzet et al., 2005; Kasser, 2011b). Extrinsic aspirations include wealth and image. These may indirectly serve some basic human needs, and are aligned generally with self-enhancement values (Grouzet et al., 2005; Kasser, 2011b).
1.2.2 Emotions, attitudes, and behaviours

How people feel towards the environment and other people forms another important part of the ProTs cluster. Emotions that belong to the cluster of ProTs can either be prosocial emotions themselves (like empathy, compassion, and love), or the experience of positive emotions when behaving in a prosocial or pro-environmental way. Regarding the latter, there is a body of literature that demonstrates the tendency for people to feel good about helping others (Aknin, Hamlin, & Dunn, 2012; Aknin, Dunn, Sandstrom, & Norton, 2013; Aknin et al., 2013; Aknin, Broesch, Hamlin, & Van de Vondervoort, Julia W, 2015; Dunn, Aknin, & Norton, 2008), and also to feel guilty when not helping (Ketelaar & Tung Au, 2003).

Attitudes are “evaluative tendencies that can both be inferred from and have an influence on beliefs, affect, and behaviour” (Milfont & Duckitt, 2010, p. 81). Pro-environmental attitudes, therefore, represent a tendency to evaluate the environment with favour, and prosocial attitudes represent a tendency to evaluate other people with favour. Because of their close relationship with beliefs, affect and behaviour; attitudes are often measured through these three aspects by proxy. For example, measures of environmental attitudes include self-reported activism and conservation behaviour, support for policies, and negative emotions associated with environmental damage (Milfont & Duckitt, 2010).

Behavioural aspects of ProTs represent the outward manifestation of the combination of the other aspects. While it might seem that the behaviour is the most important aspect, because for example reducing carbon emissions is important whether people do it for financial reasons or because they deeply value the environment, the motivations and values do matter. ProT motivations and values may make ProT behaviour more reliable and generalizable. For example, pro-environmental values would probably produce pro-environmental behaviour in a range of different contexts, while self-directed values would only produce pro-environmental behaviour in the narrower range of contexts in which there are perceived benefits to self.
1.2.3 Altruism: Altruistic motivations and intrinsically valuing

Altruism is a concept with a long history of debate around the conditions under which it exists, or even whether it exists at all (Andreoni, 1990; Batson, 2011; Cialdini et al., 1997; Fehr & Fischbacher, 2003; Nagel, 2016; Piliavin & Charng, 1990; Wilson, 1992). The debate has been compounded by variation in how altruism is defined. For example, whether it is defined as a motivational state or a behaviour, and whether it requires sacrifice in the moment, sacrifice on the evolutionary time-scale, or not necessarily any sacrifice at all (e.g., Bressan, Colarelli, & Cavalieri, 2009; Burnham, 2003; Burnham & Johnson, 2005; Dillon, Wink, & Fay, 2003; Eckel & Grossman, 1996; Krebs, 1991; Krebs & Van Hesteren, 1994; Kristeller & Johnson, 2005; Midgley, 2014; Naess & Drengson, 2008; Piedmont, 1999; Piff et al., 2015; Piliavin & Charng, 1990; Saroglou, Pichon, Trompette, Verschueren, & Dernelle, 2005; Sober & Wilson, 1999; Trivers, 1971; Wilson, 1997).

Before a more detailed discussion of altruism as defined in this thesis, it is useful to outline the broad distinction between evolutionary and psychological altruism (Wilson, 1992). This thesis is situated within psychology, and ProTs manifest in an individual's psychology over their lifespan, so psychological altruism is more relevant to this thesis.

1.2.3.1 Evolutionary vs psychological altruism

Evolutionary altruism refers to behaviour that decreases one's own fitness in an evolutionary sense (i.e., reproductive success) while increasing the evolutionary fitness of others or the group (Sober & Wilson, 1999; Wilson, 1992). By definition, a reduction in relative reproductive success over time is a reduction in the frequency of one's genes within a population. Given enough time, genes that increase the likelihood of behaviour that goes on to decrease their own relative success will be likely to dwindle if not disappear. For this reason, evolutionary altruism appears to be a conundrum, because it is defined by a process that amounts to evolutionary demise.

However, there are a number of potential explanations for how evolutionary altruism could evolve. One proposed solution is group selection, in which groups of altruists do better than groups of non-altruists (Foster, Wenseleers, & Ratnieks, 2006; Marshall, 2011). In this group selection account, evolutionary altruism is stable and adaptive. However, Burnham and Johnson (2005) argue that it is not necessary to invoke group selection, because selection at the level of the individual (e.g., through reciprocity) can be used to explain the existence of
apparent evolutionary altruism (what they call “strong reciprocity”) even if that behaviour manifests in contexts in which it is not adaptive.

Psychological altruism, on the other hand, is defined by an intention or motivation to help another as an end in itself, and is not concerned with evolutionary fitness (Sober & Wilson, 1999; Wilson, 1992). It is located in the present time scale, rather than the evolutionary time scale. Psychological altruism, therefore can still exist whether its evolutionary history is characterised by group selection (and therefore evolutionary altruism) or individual selection (and therefore not evolutionary altruism). That is, psychological altruism can be conceptualised as a proximate mechanism that evokes non-selfish behaviours that were adaptive at the group level or the individual level for a sufficient portion of our evolutionary history.

This brief discussion raises an interesting and important point. The evolutionary processes that are typically described as competitive, in which selfish genes win, are the very processes that can produce psychological altruism. Even if this “selfish” language was the best characterisation of the evolutionary processes, the language should be used carefully, because it might tend to imply that selfishness is natural and necessary, thereby reinforcing selfish behaviour (Miller, 2001). However, a case can be made that this language is not the best conceptualisation of evolution (e.g., see Nowak, 2006; Weiss & Buchanan, 2009; Weiss, Buchanan, & Lambert, 2011). Therefore, using language that emphasises the cooperative nature of life may not only be more conducive to psychological altruism and non-selfish behaviour, but it may also be more accurate.

1.2.3.2 Daniel Batson’s altruism

Perhaps the most thoroughly studied definition of psychological altruism is Batson’s altruistic motivation, which holds that altruism is a motivational state with the ultimate goal of increasing another’s welfare (Batson, 2011). An ultimate goal is an end in itself, or something that is intrinsically valued. This definition therefore implies (and Batson explicitly states this requirement) that altruism requires intrinsically valuing the welfare of something other than the self. This type of valuing, when combined with a perception that the other is in need, produces empathic concern, which is feeling for the other (i.e., compassion) rather than feeling as the other (i.e., empathy per se). Empathic concern then produces the altruistic
motivation. Whether or not this altruistic motivation produces congruent behaviour depends on other contextual factors, which might include competing motivations.

This point about competing motivations detracting from the likelihood of producing behaviour that is congruent with the altruistic motivation is an important theoretical one. It implies that altruistic motivations can exist within an array of other motivations, and therefore can exist despite the existence of other self-directed motivations to help the other in need, such as the motivation to feel virtuous. As long as it is possible for humans to possess a motivational strand in which increasing the other’s welfare is the end goal, then altruism exists. Indeed, the tendency for people to feel good about helping others (e.g., Aknin et al., 2013) would suggest that this may easily become a future motivation for helping others after such positive feelings upon helping are experienced for the first time.

Another concept that requires emphasising from this outline of Batson’s altruism is the concept of intrinsically valuing another’s welfare. If improving another’s welfare is taken as an end goal, then the only way to achieve that goal is to have the other’s welfare improve. If the end goal is, say, to feel virtuous by helping the other, and there are alternative ways to feel virtuous, then improving the other’s welfare is only one of many possible ways to achieve the end goal. If one of those other ways is perceived to be more desirable, then the helpful behaviour is less likely to occur. Motivations in which the other’s welfare is intrinsically valued are therefore more reliable producers of other ProTs than are motivations in which the other’s welfare is valued instrumentally for some other end goal. For this reason, intrinsically valuing the other is one of the main types of ProT on which the current thesis focuses. Concepts in the literature that describe intrinsically valuing nature include Biospheric Concern (Schultz, 2001) and Ecocentric attitudes (S. C. G. Thompson & Barton, 1994).

A final point to make about intrinsically valuing others is to distinguish it from intrinsic values, mentioned above in the section on values. Intrinsic values is a label applied to a category of values that includes self-acceptance, affiliation and community, and that are directly aimed at achieving basic human needs (Kasser & Ryan, 1996; Kasser & Ahuvia, 2002). A sense of intrinsically valuing others is not necessarily linked with intrinsic values, because it is possible that someone has an acute sense of their basic human needs and seeks affiliation and community in order to obtain them. In this case, affiliation and community might be perceived as instrumental to one’s own well-being. However, the ability to have a
sense of intrinsically valuing others can be conceptualised as one manifestation of a bias to strive to achieve the same basic human needs represented by intrinsic values.

1.2.4 The ProTs cluster

So far, different aspects of the cluster of ProTs (e.g., attitudes, behaviours, and values) have been described individually. However, the different aspects interact to form a cluster. Individuals can vary within different aspects of the cluster, creating variation in the degree to which they have a general outward orientation. For example, while one person’s environmental behaviour might have a psychological origin in environmental values and caring about nature for its own sake, another person’s environmental behaviour might have a psychological origin in economic motivations and self-enhancement values.

Figure 1.2 is an attempt to display the relationships between the different aspects of ProTs schematically. It tries to capture a progression from the most general manifestations of ProTs at the base, to more specific manifestations at the top, with behaviour being the most specific manifestation. Beginning at the top of the diagram, behaviour rests on motivations, which have altruistic motivations as a subset. Motivations rest on aspirations, which are more general motivations or goals. Moving further down, aspirations rest on concern, which is conceptualised as a reflection of values. If a person is concerned for something for its own sake, then it is intrinsically valued. Therefore, intrinsically valuing others is placed within concern. If something is intrinsically valued, it can produce altruistic motivations, so altruistic motivations are depicted as resting on a sense of intrinsically valuing the other. Values form a hierarchy on which concern and aspirations are based, with the most foundational values being the terminal values. Emotions and attitudes cut across multiple aspects of ProTs, because they reflect, reinforce, and influence aspects like concern, aspirations, and motivations. For this reason, they have been depicted as the walls that form the context for these other aspects.
Figure 1.2. Schematic representation of the various psychological domains through which prosocial and pro-environmental tendencies manifest.
Having outlined the ProTs cluster, it is possible to identify which specific ProTs are of particular interest in this thesis. The main one is a sense of intrinsically valuing the other. This was chosen as a focus for three reasons. The first is that, as discussed in the section on altruism above, intrinsically valuing another may be the most reliable way of producing motivations to act in their interests. This is because, if the other is intrinsically valued, then their welfare is perceived as an end in itself, and so the only possible way to protect that end is to have their welfare increase. There is no alternative, other than to live with the psychological consequences of failing to satisfy that end goal. Schultz (2002) made a similar argument, noting that emphasising the instrumental value of nature is unlikely to work, because as technology advances, the ability to replicate the benefits that nature provides will also advance. The main reason to protect nature would therefore be compromised. Similarly, Arnocky et al. (2007) argued that being concerned about environmental damage because of potential effects to the self or to other people would be less likely to produce environmental behaviour if it interfered with other human-centred values.

In addition, not only may intrinsically valuing others be an important and reliable source of specific motivations to help others, but the alternative (instrumentally valuing others) may in some contexts be detrimental to other ProTs or well-being in general. For example, evaluating other entities and their interactions in terms of monetary value (i.e., quantifying how useful they are to others) can make people less prosocial (Vohs, Mead, & Goode, 2008; Vohs, Mead, & Goode, 2006). Further, fairness-based cooperation (that is, cooperation that is for the sake of reciprocity or upholding principles) is associated with negative emotions and a reduction in cooperation, while compassion-based cooperation (i.e., cooperation that is other-centred) is associated with warm emotions and more stable patterns of cooperation (Singer & Steinbeis, 2009).

Another reason for the focus on intrinsically valuing others is that it is a requirement of Batson’s (2011) definition of altruism. It is not the main goal of this thesis to save Batson’s definition of altruism from the criticism that it only exists under conditions of oneness and is therefore not other-directed. However, if it is possible to find a predictor of intrinsically valuing the other that is not based on inclusion of other in the self, then this would be satisfying given that it was the source of the initial curiosity into this topic. The third and final reason is related to the second, namely that, Batson’s altruism aside, the concept of intrinsically valuing something other than the self is philosophically an interesting one, as discussed earlier, and has been the subject of debate (Batson et al., 1997; Cialdini et al.,
Exploring the conditions that are conducive to a sense of intrinsically valuing others may add to this debate.

The other ProT of interest to the current thesis are those downstream from intrinsically valuing others, such as aspirations or behaviours. Real world behaviour, and its more immediate aspirational precursors, are important if one is interested in creating change in the world. The effects of oneness on actual behaviour (or aspirations to behave) is therefore considered to be an important final outcome of a motivational strand. Intrinsically valuing others is interesting, but it is particularly interesting and potentially important if it relates to “real world” consequences.

At this point, the two main conceptual aspects of the current thesis are in place: the oneness typology and the concept of ProTs (although there is no claim that the concept of ProTs is a similarly important contribution to the literature as the oneness typology). The concept of ProTs was set up for three reasons: 1) to use as shorthand throughout the thesis when describing various studies that tested for relationships between oneness concepts and a wide range of different ProTs; 2) to provide background to the justification for selecting the given ProTs of interest to this research; and 3) to acknowledge that, although the research presented in the current thesis focuses on just select aspects of ProTs, they do not exist in isolation from other ProTs, and that understanding how to foster the full cluster (and therefore a more general outward orientation) would be ideal for creating a better world.

The final section of the introduction will outline the evidence for a relationship between oneness concepts and various ProTs. This will lead to the specific relationships between the different types of oneness and specific ProTs that are tested in the current thesis.

### 1.3. Relationship between oneness and ProTs

The relationship between oneness and ProTs is implied in popular discourse. For example, the phrase “we all bleed the same colour blood” refers to a shared essence and is commonly used as a way of promoting prosocial values and attitudes. Similarly, the movie *Earthlings* (Monson, 2005) promotes veganism, and its title refers to a shared essence (i.e., that humans and non-human animals are all “of the earth”), which may help to foster a sense that animals have intrinsic value. In the other direction, people seem to dehumanise people they are against, which reinforces anti-social tendencies towards them (Struch & Schwartz,
The thinking would seem to be that if they are not human, they are essentially different from us, and therefore do not demand the same level of respect as we do.

This folk understanding of the relationship between oneness and ProTs is consistent with the well-established trend found in the literature. The present section outlines the empirical evidence for this relationship in two sections. One focuses on the relationship between fleeting oneness experiences and ProTs, and the other focuses on the relationship between oneness beliefs/feelings and ProTs. This leads to identifying the gap in this literature, and identifying general hypotheses that the current thesis explores in relation to this gap.

1.3.1 Experiences and ProTs

A range of oneness experiences predict a range of ProTs. Weinstein et al. (2009) found that experiences of immersion in nature predicted intrinsic aspirations (placing a high importance on contributing to the betterment of society and establishing relationships), suggesting that experiences can have an affect across domains, from nature to humanity. Similarly, Huber and Macdonald (2012) found that spiritual experiences predicted both empathy and self-reported prosocial behaviour. Further, psilocybin-induced mystical-type experience have been found to predict an increase in prosocial tendencies (Griffiths, Richards, McCann, & Jesse, 2006; Griffiths, Richards, Johnson, McCann, & Jesse, 2008; Griffiths et al., 2011) even 14 months after the experience (Griffiths et al., 2008; Griffiths et al., 2011).

Awe experiences, which are characterised by a sense of diminished self and feelings of amazement in response to perceived vastness, have also been found to predict prosocial behaviour (Piff et al., 2015), and to decrease aggression (Yang, Yang, Bao, Liu, & Passmore, 2016). Although awe is not quite a oneness concept, it is closely related to oneness because it is partly characterised by a sense of a shrinking of the self (Piff et al., 2015). It can therefore draw attention to the presence of self-transcendent entities, which may do one or both of two things: 1) make a sense of connection with them more likely, and 2) reduce any tendency for one to focus only on one’s own welfare, which is what Piff et al. (2015) argue underpins their results.
Huber and Macdonald’s (2012) results, and those of the psilocybin studies (Griffiths et al., 2006; Griffiths et al., 2008; Griffiths et al., 2011), show that oneness experiences can have an effect beyond the end of the experience itself. This implies that the transient experiences create some kind of enduring change. One explanation that might account for this is that oneness experiences prompt longer lasting feelings of oneness in the form of oneness intuitions, and/or longer lasting explicit oneness beliefs. There is evidence for this hypothesis. Weinstein, Przybylski, and Ryan (2009) found that connectedness to nature (a state-like, intuited connection to nature) mediated the relationship between the experience of immersion in nature and prosocial aspirations, suggesting that the immersion experience influenced longer lasting intuitions, which go on to influence aspirations. Further, when psilocybin-induced mystical experiences were accompanied by meditation support for six months after the experience, long term changes in prosocial tendencies were greater than not having meditation support (Griffiths et al., 2018). This suggests that the experience can be integrated into more stable psychological structures, and that when consistent and explicit opportunities for such integration are provided over time, the longer lasting downstream effects can be even stronger.

1.3.2 Beliefs/feelings and ProTs

Beliefs and feelings about various types of oneness connections with nature have also been found or theorised to be related to various ProTs. Indeed, the hypothesised relationship is so strong that some have treated oneness and ProTs measures as two sides of the same construct. For example, Bragg (1996) argued that the deep ecology perspective is characterised both by intrinsically valuing all life and embracing an “expansive or transpersonal sense of self [or ‘ecological self’]” (95). Naess and Drenson (2008, p. 84) echoed the same sentiment when describing the ecological self, noting that “there must be identification for there to be compassion”. Similarly, Dutcher et al. (2007) argued that their concept of connectivity with nature, characterised by a sense of shared essence with nature, “represents an attempt to conceptualise a value orientation that underlies environmental concern and behaviour” (p. 490). Further, altruism has been defined as including both its prosocial dimension and a “cosmic feeling of oneness” (Krebs & Van Hesteren, 1994) and including others in the self (Krebs, 1991). Moreover, Hamilton (2008, p. 203) argues that morality is based on “metaphysical empathy”, which itself comes from merging with a “universal Self”. Further still, Aşkun & Çetin (2017) take the relationship between oneness
and ProTs to be so close that they advocate for using behavioural measures as a proxy of oneness. The above claims are not unfounded, especially considering that oneness and some ProTs may have a possible shared evolutionary history. That is, the capacity for oneness might have evolved as a proximate mechanism to support kin- or group-directed cooperation behaviour, suggesting that the relationship between oneness and ProTs has been intertwined even across the evolutionary time scale.

Nonetheless, while a case can be made for the logical relationship between oneness and ProTs, it is best not to assume that it will hold in reality, especially for phenomena as complex as oneness and ProTs, and as potentially susceptible to contextual influences. That said, the general trend in the empirical literature is strongly in the hypothesised direction. For example, metapersonal self-construal has been found to positively predict biospheric concern and environmental behaviour (Arnocky et al., 2007), and negatively predict racism (DeCicco & Stroink, 2007). Various concepts roughly capturing oneness with nature have been found to predict a range of ProTs (Dutcher et al., 2007; Hoot & Friedman, 2011; Mayer & Frantz, 2004; Nisbet et al., 2009; Olivos & Aragonés, 2011; Schultz et al., 2004; Weinstein et al., 2009), even in young children (Cheng & Monroe, 2012). As have various concepts roughly capturing oneness with people (Burton-Chellew, Ross-Gillespie, & West, 2010; De Cremer & Stouten, 2003; Mashek et al., 2007; McFarland et al., 2012; Twenge, Baumeister, DeWall, Ciarocco, & Bartels, 2007).

1.3.3 Gaps and hypotheses

The problem is, as will be argued thoroughly in Chapter 3, the relationships found to date between oneness and ProTs are not based on measures that distinguish between the different types of psychological ontology (PO) outlined in the oneness typology. If the three different POs (essential, interdependence, and expansion) are distinct (evidence for this is provided by a factor analysis in Chapter 4 of the present thesis), then the positive relationship between oneness and ProTs found in the general trend in the literature may be overlooking important nuances based on the different types of oneness in the typology. This is one of the main gaps in the literature that the present thesis addresses.

Hinting at possible nuances yet to be fully developed, in their study on the relationship between self-expansiveness and ProTs, Hoot and Friedman (2011) found that all-encompassing self-expansion did not predict environmental behaviour, while connection to
nature did. This suggests that not all types of oneness are equally strong in their relationship to behavioural ProTs. Because all-encompassing oneness would seem to have a stronger “spiritual” connotation compared to connection to nature, this result also relates to the debate over whether spirituality is conducive to real-world action (Dillon et al., 2003). Another example of nuance that requires development is whether a sense of interdependence or a sense of something deeper is necessary for deep environmental values (Drengson, Devall, & Schroll, 2011; Dutcher et al., 2007). Yet another is whether expansion is the only way to achieve a sense of intrinsically valuing others, and therefore whether altruism is even possible if it is based on intrinsically valuing something other (Batson et al., 1997; Batson, 2011; Cialdini et al., 1997; Neuberg et al., 1997). The results of the study presented in Chapter 5 sheds some light on these questions.

Given that there may be important nuance in the relationship between oneness and ProTs, and that the oneness typology categorises basic characteristics of oneness, the research in the present thesis attempts to explore potential nuance offered by the different types of oneness in the typology. In particular, the research outlined in Chapter 5 tests for the differential effects of the three POs on ProTs, with oneness experiences as one potential source of the different oneness beliefs and feelings. These potential relationships are explored across two broad scopes: nature and humanity. The ProTs of interest are a sense of intrinsically valuing the other (nature/the environment, or humanity/people in general), with behaving or aspiring to behave in the interest of the other as a more downstream ProT. The justification for the focus on these particular kinds of ProTs is outlined at the end of the previous section on ProTs. The specific hypothesised path models that integrate these variables are outlined in Chapter 5. However, the general hypothesised relationships are signposted here.

As already argued, oneness experiences must influence more stable psychological structures if they are to exert an influence on ProTs beyond the end of the experience itself. Oneness beliefs and feelings are two plausible types of contenders to fulfil this role. Further, because oneness experiences are hard to describe, they are open to interpretation based on pre-existing knowledge and cultural contexts (Z. Chen et al., 2011; Z. Chen et al., 2011; Garside, 1972; Hood, 2006; Yamane, 2000). Oneness experiences would therefore be hypothesised to predict beliefs and feelings relating to all three POs.
The three POs are hypothesised to be different in ways that are important for ProTs. In particular, *expansion* is predicted to be positively related to intrinsically valuing the other. The justification is partly logical, because, assuming one intrinsically values themselves, then the intrinsic value is extended to everything included in the self. This theoretical logic appears throughout the oneness literature (e.g., Cialdini et al., 1997; Mashek et al., 2007; Naess & Drengson, 2008; Neuberg et al., 1997; Schultz, 2001; Schultz, 2002). The justification is also partly based on empirical evidence, but this was generated using scales that do not adequately isolate the *expansion* PO. However, to the extent that the Inclusion of Other in the Self family of scales (e.g., Aron et al., 1992; Schultz, 2002) can be taken to measure *expansion*, there is some empirical evidence for a relationship between *expansion* and intrinsically valuing the other (e.g., Schultz, 2001).

Regarding the *essential* PO, it is hypothesised also to create a sense of intrinsically valuing the other, but rather than being based on a sense that “you are me”, it is based on a sense that “you are essentially the same as me”. Therefore, it is a more outwardly oriented sense of intrinsically valuing the other, rather than one that is inwardly oriented from including the other in the self. There is some evidence that supports this hypothesis. In an attempt to explain ProTs directed to the ingroup but not the outgroup, (Krebs, 1975; Stotland, 1969) found that perceived similarity predicted the tendency to empathise with the other. Similarly, Swann et al. (2012) argue that the evolutionary mechanisms responsible for the evolution of cooperation with the tribe have been co-opted to extend to larger groups through the use of language such as “shared blood… national identity, history of suffering… [which are all examples] resembling the modern construct of ‘shared essence’” (p. 448). The resulting perception that members of the outgroup are “essentially different”, and members of the ingroup are “essentially the same”, is what Swann et al. (2009) argue motivates extreme pro-group behaviour (albeit at the cost of the outgroup). A sense of shared essence can extend beyond human groups to all of humanity, nature, or existence, and this too has been found to predict ProTs (Dutcher et al., 2007; Garfield et al., 2014; Piedmont, 1999). However, only Dutcher et al.’s (2007) study used a ProT measure of intrinsically valuing the other, suggesting that there is room for investigating in more detail this specific relationship between an *essential* PO and intrinsically valuing others.

Regarding the *interdependence* PO, it is hypothesised to create a sense of instrumentally valuing the other. This is because if one is perceived to be connected to the other through a symbiotic relationship, then a salient feature of the relationship is that harm to...
the other will cause indirect harm to self. A motivation to protect the other based on this feature is one in which the other is instrumentally valued. Consistent with this, multiple theorists have argued that deep environmental values must stem from something deeper than an interdependent connection (Drengson et al., 2011; Dutcher et al., 2007), implying that an interdependent connection can only lead to less deep (i.e., instrumental instead of intrinsic) value placed in the other. However, there is little direct evidence for the hypothesised relationship between the interdependence PO and instrumentally valuing the other. This is partly because there is no scale that adequately isolates the interdependence PO (as shown in Chapter 3). Nonetheless, those measures with a substantial element of interdependence have found a positive relationship between oneness and ProTs in general (e.g., J. L. Davis et al., 2009; Hoot & Friedman, 2011; Mayer & Frantz, 2004). It remains to be tested explicitly whether interdependence predicts instrumentally valuing others rather than intrinsically valuing them.

Taking together the concepts and arguments outlined in the sections on ProTs and on their relationship with oneness, the main contribution the current thesis makes to the literature is an exploration of potential nuance in the already established general relationship between oneness concepts and ProTs. It addresses this gap using the dimensions of the oneness typology to generate novel predictions about how different types of oneness might differentially affect the ProTs of interest.

1.4 Summary of key goals

The goals of this thesis can be summarised under two main aims.

1) Develop the oneness typology

The first aim is based on the observation that the concept of oneness in the psychological literature is not well integrated, and it is not always clear exactly what a given oneness concept is trying to describe and measure, nor how different oneness concepts compare to each other. The oneness typology is the main contribution of this thesis to the literature. The typology is designed with four goals in mind.

1) The first goal of the typology is for it to help to define the concept of oneness more clearly. In particular, oneness is a sense of connection to a self-transcendent entity,
where the connection is a belief, feeling, or experience of expanding to include the other, sharing an essence with the other, or being interdependently connected to the other. In providing this conceptual clarity, it will provide language and concepts that will help in navigating the literature related to oneness, and help in making comparisons between concepts.

2) The second goal of the typology is for it to have the potential to guide future research. It will do this by assisting in selecting or creating a measure of the appropriate kind of oneness for the research question, and generating novel predictions about the differential role of different kinds of oneness in predicting other psychological outcomes.

3) The final goal related to the typology is that the important distinctions that it makes will be supported statistically using factor analysis. In doing so, a scale will be produced that can be used in future research that wishes to isolate a specific type of oneness or to test for differential effects of different types of oneness. This is an important contribution to the literature because, as will be argued in Chapter 3, no existing scale adequately distinguishes between the three POs.

2) Relationship between oneness and ProTs

The second main aim is to contribute to the understanding of the relationship between oneness and ProTs. This is done through two goals.

1) The first goal is to test for a causal relationship between oneness and ProTs. This was attempted in the pilot study before the oneness typology (and the need for it) was conceived.

2) The second goal is to test for the differential effects on ProTs of different types of oneness in the typology. This is divided into two sub goals, both of which are tested in Chapter 5 of the present thesis.
   a. The first sub goal is to test for differential effects of the three psychological ontologies (POs). Given that the typology is novel, as are the scales that differentiate between the POs, the specific relationships between these different types of oneness and ProTs (particularly intrinsically valuing others and behaving or aspiring to behave in their interests) has never been tested. If the distinctions in the typology are as important as they are argued
to be, then the results relating to their differential effects on ProTs are equally important.

b. The second sub-goal is to test for the possibility that transient oneness experiences affect longer lasting oneness beliefs and feelings, thereby providing a way for fleeting oneness experiences to influence ProTs beyond the end of the experience itself.

Working towards these goals is important, because they not only have the potential to contribute to our understanding of oneness and how it relates to ProTs, but they also have implications for how to foster ProTs. That is, if particular types of oneness are more conducive to ProTs, then language that reflects and reinforces those types of oneness may be particularly useful to that end. Understanding how to foster ProTs is a worthwhile goal at any time, but particularly in the context of global environmental and social problems, such as climate change, social inequality and poverty, and animal welfare issues. It is my hope that this thesis is able to go beyond just exploring the concept of oneness by also helping to contribute in some way to these kinds of issues.
Chapter 2  
Novel Oneness Primes and a Causal Relationship Between Oneness and ProTs: A Pilot Study  

Overview  
Research on the relationship between oneness and prosocial and pro-environmental tendencies (ProTs) consistently finds a positive correlation. This trend supports the intuitive idea that we tend to value and want to protect that with which we perceive ourselves to be profoundly connected. However, because most of the existing research is correlational, there is room for experiments that test for a causal relationship between oneness and ProTs. The research presented here took a step towards addressing this gap by attempting to experimentally manipulate oneness perceptions, then observing their effects on a measure of prosocial tendencies (in the present study the Community Aspirations subset of the Aspirations Index). In doing so, the research addressed two main questions: 1) do two novel oneness prompts produce an increase in scores on a range of oneness measures (covering oneness with humanity, nature, and all of existence)? And 2) if so, does the increase in oneness scores explain a corresponding increase in community aspirations? In general, the results suggest that the experimental conditions were no more effective than the control conditions with respect to increasing oneness scores on the oneness measures used in this study. Further, the conditions did not predict community aspirations, so no mediation of oneness could be tested. However, preliminary evidence is presented for the utility of distinguishing between different types of perceived oneness connections that are not explicitly distinguished in the oneness measures used here, nor thoroughly distinguished in the oneness literature in general. In particular, the potential effectiveness of the two oneness primes found preliminary support when the items in the existing scales were re-arranged according to whether they referred to oneness via interdependence with others or oneness via sharing an “essence” with others. The implications for developing these ideas in future research is discussed.
2.1 Introduction

Sustainability in the face of a growing population and environmental degradation is becoming an increasingly important and salient goal within multiple fields. The field of psychology can contribute to this goal by studying prosocial and pro-environmental tendencies (ProTs, in the form of values, attitudes, motivations, and behaviours) and their psychological precursors. A number of potential precursors to ProTs that are described in the psychological literature form a category that are here referred to as “oneness” concepts. Oneness concepts describe a conception of self and other as profoundly connected, as opposed to fundamentally a discrete and separate entities. This is not to say that people who score highly in a oneness measure necessarily believe that they are not a meaningfully distinct entity at some level, but rather that there is a salient sense (be it in the form of belief, feeling, etc.) of some kind of profound connectedness that unites the self and other into a meaningful entity in its own right. These concepts are based on the idea that the self is a flexible construct that varies across people and contexts (e.g., Markus & Kitayama, 1991), and that the self can be construed such that it overlaps with the conception of “other” (e.g., Aron et al., 1991; Aron et al., 1992).

The oneness concepts focussed on in this research were inclusion of nature in the self (Schultz, 2002), connectedness to nature (Mayer & Frantz, 2004), metapersonal self-construal (DeCicco & Stroink, 2007), and a novel concept labelled inclusion of humanity in the self. Inclusion of nature in the self (INS) belongs to a family of concepts that describe the expansion of the self to include some other entity, be it another person (Aron et al., 1992), a social group (Mashek et al., 2007; Tropp & Wright, 2001), or a more abstract entity like humanity (Leary et al., 2008; McFarland et al., 2012), nature (Leary et al., 2008; Schultz, 2002), and even all of existence (Friedman, 1983; Pappas & Friedman, 2007). Schultz (2002) defined INS as a cognitive representation of the self that overlaps with the cognitive representation of nature. The conscious manifestation of INS is typically measured using a self-report scale that consists of a single pictorial item in which pairs of circles (one representing self and one representing nature) become increasingly overlapped. The overlapping circle measure is typical for this family of concepts. The present study also introduced the concept of inclusion of humanity in the self (IHS) as a humanity-centred counterpart to INS. The assumption is that, in line with the way this family of concepts is typically measured, IHS can also be measured meaningfully using the overlapping circles paradigm.
Connectedness to nature (CTN) is defined as an emotional, affective connection to nature (Mayer & Frantz, 2004). The language Mayer and Frantz (2004) use to describe CTN suggests that it refers at least partly to an inclusion of nature in the self, but also to a sense of sharing some kind of essence with nature, and to a sense of belonging to an interacting community with nature. Although this appears to make it a broader concept than INS, the two are strongly correlated (Tam, 2013), perhaps partly because the relatively abstract nature of the pictorial “inclusion of other in the self” measures render them open to interpretation (Aron et al., 1992) and therefore similarly broad.

Finally, DeCicco and Stroink’s (2007) concept of metapersonal self-construal (MSC) is an extension on Markus and Kitayama’s (1991) concepts of independent and interdependent self-construal. Self-construal refers to people’s definitions of self, other, and how they relate to each other. Someone has a metapersonal self-construal when they define themselves as being fundamentally connected to all of existence (DeCicco & Stroink, 2007). More specifically, the language used to describe MSC in detail suggests it is cognitive rather than affective, and that it has aspects of inclusion of other in the self, and sharing some kind of essence with all of existence, be it spiritual or physical.

INS, CTN, and MSC have all been found to correlate positively with various ProTs (e.g., Arnocky et al., 2007; A. C. Davis & Stroink, 2016; J. L. Davis et al., 2009; Mayer & Frantz, 2004; Schultz, 2001; Weinstein et al., 2009). Although the research presented here focussed only on the four oneness measures outlined above, the positive relationship between oneness and ProTs has been found for a wide range of other oneness concepts. For example, Aron et al.’s (1992) Inclusion of Other in the Self scale predicts the motivation to help another in need (Cialdini et al., 1997; Maner et al., 2002); Mashek et al.’s (2007) Inclusion of Community in the Self scale predicts helping behaviour towards the community (Mashek et al., 2007); Leary et al.’s (2008) Allo-Inclusive Identity scale predicts kindness, forgiveness, social/ecological concern, and valuing social relationships (Leary et al., 2008); Dutcher et al.’s (2007) Connectivity with Nature scale predicts environmental concern and self-reported pro-environmental behaviour; the NR-Self subscale of Nisbet et al.’s (2009) Nature Relatedness scale predicts vegetarianism, organic purchases, membership in an environmental organization, identifying as an environmentalist, love of animals, humanitarianism, and commitment towards ecological issues; the Experiential-Phenomenological dimension of MacDonald’s (2000a; 2000b) Expressions of Spirituality Inventory (i.e., transient experiences of oneness) predicts self-reported prosocial behaviour.
(Huber & MacDonald, 2012); and the Oneness Beliefs scale predicts pro-environmental attitudes and behaviour (Garfield et al., 2014).

Although this clear trend in the literature is compelling, it is based mostly on correlational research, leaving room for research into the causal relationship between oneness and ProTs. The hypothesis that such a causal relationship exists is reasonable because 1) it makes theoretical sense, and 2) the few studies that have tested for causality have found positive results. Regarding (1), the theoretical logic, if one of the main aspects of oneness is an inclusion of other in the self, then it should follow that the other entity in question is valued to the extent that the self is valued. Moreover, if another component of oneness is a sense of belonging to a wider natural ecosystem with nature (as is the case in the Connectedness to Nature scale), then people should be motivated to protect the other to the extent that they perceive their welfare to depend on the other. The theoretical logic that others are valued because of a unity between self and other already appears in the literature. For example, Schultz et al. (2005) theorised that environmental concern stems from what he calls self-transcendent values, which ultimately stem from a self-construal that extends beyond the immediate self (i.e., a self-construal that would be classified as an example of oneness). Similarly, Dutcher et al. (2007) argued that environmental values stem from a sense of essential oneness or “sameness” between self and nature.

Regarding (2), the empirical evidence for oneness causing ProTs, Cialdini et al. (1997) found that inclusion of other in the self mediated the effect of experimentally manipulated relationship closeness on the motivation to help. However, to experimentally manipulate relationship closeness participants were asked to imagine someone with whom they already had a predetermined degree of closeness (e.g., imagine an acquaintance, a close friend, a family member, etc.). As Batson et al. (1997) responded, this manipulation carries with it a number of confounds, including duty, loyalty, and past and future reciprocity. The study presented here resolves this by attempting to prime oneness between something approximating strangers. The present study also expands on Cialdini et al.’s study by applying its logic to oneness and ProTs that extend beyond one other individual. These broader kinds of oneness and ProTs are the main interests of the present research.

In an experimental study that did focus on more wide-reaching oneness and ProTs, Weinstein et al. (2009) found that the Connectedness to Nature scale mediated the relationship between experimentally manipulated immersion in nature and intrinsic
aspirations (e.g., valuing contributing to the betterment of society). However, their study tested for the effects of nature-centred primes and nature-centred oneness on human-centred prosocial tendencies. This produced somewhat of a mismatch between the “natural” domain of the oneness and the “social” domain of the ProTs. Interestingly, they found that nature-centred oneness increased human-centred ProTs, suggesting some level of cross-over across the domains. Nonetheless, the present study expands on Weinstein et al.’s study in two main ways. The first is that it aligns the domains of the oneness primes and the ProTs by making them all human-centred. The second is that it tests for the mediating effect of oneness measures with three different domains, namely humanity, nature, and the more all-encompassing oneness captured by the Metapersonal Self-Construal scale, which has been suggested to be a good candidate for experimental studies of the kind conducted here (Arnocky et al., 2007; A. C. Davis & Stroink, 2016).

The use of human-centred primes is a notable difference from Weinstein et al.’s study. Human-centred primes are both interesting and useful. They are interesting because just as oneness with nature seeped into prosocial tendencies in Weinstein et al.’s study, human-centred primes might foster human-centred ProTs through oneness acting at a range of different scopes (humanity, nature, and beyond). Human-centred primes are also useful because many people whose ProTs one might be interested in will live in stereotypically “non-natural” environments, such as cities. Therefore, human-centred primes lend themselves more readily to many real-world applications. Further, the human-centred primes used here are relatively easy to reproduce in laboratory settings, because they do not require access to natural settings.

### 2.1.1 Oneness primes

In order to test for a causal relationship between oneness perceptions, this study attempted to manipulate them by using two novel, human-centred oneness primes: gazing into a stranger’s eyes for one minute and the revelation of shared “infinite values”.

#### 2.1.1.1 Eye gaze

The “eye gaze” prime involved gazing silently into a stranger’s eyes for one minute in a positive setting. While Weinstein et al. (2009) focused on immersion in nature, gazing silently into a stranger’s eyes in a positive setting offers a possible experience of “immersion
in humanity”. The potential of this task to prime oneness is based predominately on anecdotal evidence, and was initially motivated by a personal experience of the primary investigator. Some of the anecdotal evidence can be found by searching for “eye gaze with stranger” in the popular internet website YouTube. This returns a number of interesting results, including a video of people gazing into strangers’ eyes for 4 minutes. The video has over 6.2 million views at the time of writing (SoulPancake, 2015). Another YouTube video by a group called The Liberators International (2015) shows strangers sharing eye contact for one minute. That video has just over 250,000 views. The Liberators International group also has a Facebook page with over 140,000 likes (TheLiberatorsInternational, 2014). A search of their past organized events revealed that in 2017 they arranged over 60 eye gaze experiments around the world in a series they called “The World’s Biggest Eye Contact Event – 2017”. According to the Facebook event page, the event in Warsaw, Poland had over 10,000 people interested in addition to the 1,900 people who attended. A similar group, the Australian based Human Connection Movement, had over 10,000 likes on Facebook at the time of writing, and also organises “eye gaze with strangers” events (thehcmovement, n.d.). It could be said that the eye-gaze task went “viral”.

This viral phenomenon seems to have its roots in the popularisation of Aron et al.’s (1997) list of 36 questions that were found to generate interpersonal closeness. Wide-reaching news providers, such as the New York Times (D. Jones, 2015), and other media outlets, such as Big Think (O. Jones, 2015), published articles citing Aron et al.’s (1997) paper, and challenging people to try the 36 questions plus the eye gaze task for themselves. There is even a website dedicated to the task (36 questions: How to fall in love.). However, the eye gaze task itself is not present in the Aron et al.’s (1997) original paper, so it is not clear how it came to be included in the popularised version.

Watching these videos, and reading accounts of what people experience during the eye gaze task, suggests that eye gaze with a stranger, at least in these kinds of positive settings, is typically a profoundly emotional experience that fosters a sense of deep connection with, and empathy for, not only the other person but also humanity in general. The sense of wide reaching connection might be due to the task being performed with a stranger. A stranger has the possibility to represent anyone and everyone – humanity in general. These accounts suggest it may be a useful human-centred oneness prime.
Despite the widespread popular interest in the eye gaze task, its psychological effects have yet to be measured and reported in the scientific literature. Therefore, the eye gaze task is not only a good candidate for priming oneness, but it is an interesting pursuit in its own right to begin to formally measure its psychological effects.

2.1.1.2 Infinite values

The “revelation of shared infinite values” prime involved people coming up with their own three things of infinite value, and then being shown a word cloud of the most common responses to this task based on previous research. According to Harré (2018, p. 37) infinite values are things deemed to be “sacred, precious or special; of value for their own sake”. She continues, noting that things of infinite value “make the world truly alive… [they] can be in any dimension: an emotion, a relationship, part of the natural world, a quality or an object”. These are contrasted with finite values, which are things that are valuable “because of what they signify or enable. They may be of value only to a particular group of people who deem them so. They can be in any dimension: an emotion, a relationship, part of the natural world, a quality or an object” (Harré, 2018, p. 40). Although these are labelled infinite and finite values, they are really things of infinite and finite value. Harré et al. (2017) found that people of different ages and from different backgrounds (albeit all within a westernised, Anglo context) tended to offer (and relate to) the same pattern of infinite values, which were predominately centred around connection (see Appendix A for a word cloud of the most common things of infinite value). When participants were asked to offer their own infinite values, and were then shown a word cloud of the most common responses, many expressed a sense of belonging to a common humanity (Harré et al., 2017).

A sense of belonging to a common humanity can be taken to represent “sharing an essence”, which is taken here to be a form of oneness connection. While oneness via inclusion of other in the self would create a sense that “you are part of me”, oneness via recognizing a shared essence would a create a sense that “you are essentially the same as me”, or possibly “you come from the same original source as me” (for a similar distinction, see Droseltis et al.’s (2010) dimensions of place identification). This idea of sharing an essence is already reflected in some of the oneness concepts central to the present research. For example, the Connectedness to Nature scale includes items that refer to sharing a life force with nature, and both the Connectedness to Nature scale and the Metapersonal Self-
Construal scale have an item referring to a sense of kinship with other life, both of which imply coming from a common source and sharing a fundamental property (i.e. life or “blood”). Therefore, one hypothesis is that the revelation of shared infinite values will produce greater scores in our selection of oneness measures.

A sense of belonging to a common humanity (or shared essence in general) might be expected to predict ProTs because of its relation to perceived similarity, which has been found to predict prosocial tendencies (Batson, Lishner, Cook, & Sawyer, 2005; Bressan et al., 2009; Cialdini et al., 1997; M. H. Davis, Conklin, Smith, & Luce, 1996; Heinke & Louis, 2009; Henrich, 2004; Korchmaros & Kenny, 2006; Oveis et al., 2010; J. H. Park & Schaller, 2005; Rushton, Russell, & Wells, 1984). Perceived shared essence could be categorised as a subset of perceived similarity, in which the perceived similarity exists at a fundamental level rather than a superficial one. Some of the literature on perceived similarity uses superficial markers of similarity, such as placing dots of the same colour on a subset of participants (Riolo et al., 2001). One explanation for how this superficial similarity predicts prosocial tendencies is that the evolutionary mechanism of kin selection has shaped us a bias to favour the protection of perceived kin, where the perception of shared kinship is based on cues such as shared physical attributes. The revelation of shared infinite values task we use here represents a more profound marker of perceived similarity, i.e., a marker that directly reveals a shared fundamental property or essence – a shared humanity revealed through shared infinite values.

Taken together, the general hypothesis is that these two human-centred primes will lead to higher scores in all four of our oneness measures, and that these increases in oneness scores will correspond to increases in community aspirations (the subset of ProTs used here). The more specific hypotheses are stated at the end of the methods section after outlining the measures on which they are based.

2.2 Method

Participants

The participants were 466 undergraduate psychology students from the University of Auckland. Given the large sample size, the statistical power for each analysis run in this study was expected to be above the 0.8 level recommended by Cohen (1992). Sensitivity
analyses were run using the power calculator “G*Power” (Faul, Erdfelder, Lang, & Buchner, 2007), which found that the range of analyses run in this study required only small effect sizes of Cohen’s $f^2$ ($0.02 < f^2 < 0.15$) (Selya, Rose, Dierker, Hedeker, & Mermelstein, 2012). The age range of the participants was 16 to 68, with a mean age of 19.4, and a median age of 18. Just over 73% of the participants were female, while 26.3% were male. Three individuals specified a gender identification other than male or female (they were “male trans”, “fluid”, and “female mostly”). Participants were encouraged to participate as part of a learning exercise for the stage one psychology course in which they were enrolled. They were given a participant information sheet, and were asked for their consent for their data to be used for research purposes. They were reminded that they could leave the experiment at any time. The research was approved by the University of Auckland Human Participants Ethics Committee.

**Oneness primes**

As outlined in the introduction, two novel oneness primes were used, both of which formed a different set of experimental conditions and control conditions. The first was a one minute, silent eye gaze with an unfamiliar classmate. This experimental condition had three associated control conditions. One was a one minute casual chat with an unfamiliar classmate, which controlled for the effect of general, one-to-one human interaction on oneness scores. Another was a one minute silent eye gaze with a drawing of neutral eyes (see Appendix B), which controlled for the effect of the presence of eyes on prosocial tendencies (Bateson, Callow, Holmes, Roche, & Nettle, 2013; Bateson, Nettle, & Roberts, 2006; Burnham, 2003; Burnham & Hare, 2007; Haley & Fessler, 2005), allowing the effects of the human-human aspect of the eye gaze task to be isolated. The final control involved completing the questionnaire without doing any task, thereby establishing a baseline. Taken together, these controls allowed for the conclusion that any unique effects of the eye gaze task were not simply due to interacting with another human or being exposed to a pair of eyes, but specifically to gazing into another human’s eyes.

The second oneness prime was the revelation of shared infinite values. This involved asking participants to generate three things of infinite value to them, followed by presenting participants with the word cloud of the most common responses to this task based on previous research (Harré et al., 2017, see Appendix A). This experimental condition had three associated control conditions. The first was generating three things of infinite value and then
completing the rest of the questionnaire without being shown any word cloud. It is possible that thinking of what is most important to you in life primes oneness and fosters prosocial tendencies, without the revelation that these things of infinite value tend to be shared. This “no word cloud” condition controlled for this possibility. The second control condition was the same as the baseline condition used in the group of eye gaze conditions. That is, the data was used from the same group of participants who completed only the questionnaire without any preliminary tasks as a baseline measure. The final control consisted of the same infinite values task, but in this condition participants were shown the word cloud of the most commonly reported things of finite value (see Appendix C) and were told that it was the infinite value word cloud. This could be classified as another experimental condition, but one that would be expected to reduce oneness scores based on the reasoning used to hypothesise an increase in oneness scores after being shown the true infinite values word cloud. Taken together these controls allow the conclusion to be drawn that any unique effects of the revelation of shared infinite values were not due simply to thinking about the most important things in life or being shown a word cloud of values regardless of whether they were the real responses to the infinite values task.

### 2.2.1 Measures

**Oneness**

As outlined in the introduction, oneness was measured using variants of the Inclusion of Other in the Self scale (Aron et al., 1992), in particular the Inclusion of Nature in the Self scale (Schultz, 2002) and a novel measure called the Inclusion of Humanity in the Self scale. In addition, the Metapersonal Self-Construal scale (DeCicco & Stroink, 2007) and the Connectedness to Nature scale (Mayer & Frantz, 2004) were also used. This array of measures was chosen because together they capture oneness at an appropriately broad level (humanity, nature, all of existence) for more general ProTs. These scales are also sufficiently different from each other to be useful in this relatively exploratory experiment. For example, they capture the concept of including other (both nature and humanity) in the self, as well as a sense of belong to an ecosystem and sharing an essence with nature and even all of existence. While it would be predicted that the human-centred characteristic of our oneness primes would produce higher scores in the similarly human-centred inclusion of humanity in the self, they might also produce higher scores in more broad oneness (i.e., with nature and all of
existence), which would make them particularly useful tasks for generating more general ProTs. Although the interest was predominately in the effects of the oneness primes on more general, wide reaching oneness measures, the original Inclusion of Other in the Self scale (Aron et al., 1992) was included in eye gaze conditions, to measure the effect of this task on oneness with the specific eye gaze partner.

In addition to the four quantitative measures of oneness, open ended questions were included in some of the conditions. Oneness is a complicated concept to define and measure, so collecting raw responses to the primes and controls allowed an exploration the effects of this task beyond the language used in the established, quantitative oneness measures. For the eye gaze set of conditions, participants were asked to report how they felt while performing their respective task (either the real eye gaze, drawn eye gaze, or chat). The baseline condition had no task, so no open ended question was included. For the infinite values set of conditions, participants were asked to report on what it was like to see their respective word clouds (either the infinite word cloud or the finite word cloud). The baseline and no word cloud conditions did not include the open ended question because there was no word cloud to report on. These open ended measures provided data on the raw experience of engaging in these oneness primes, in addition to the data collected within the constraints of the four quantitative oneness measures used. The quantitative measures of oneness are presented below in Figures 2.1-2.3, and Table 2.1.

![Diagram of the Inclusion of Other in the Self scale](image-url)

*Figure 2.1. The Inclusion of Other in the Self scale. Participants were instructed to “please circle the picture below which best describes your relationship with your eye gaze partner [OR] introduction partner [OR] person you looked at the drawn eyes with”. Adapted from Aron et al. (1992).*
Figure 2.2. The Inclusion of Humanity in the Self scale. Participants were instructed to “please circle the picture below which best describes your relationship with your all of humanity”. This was a novel adaptation from Aron et al. (1992) and inspired by Schultz (2002).

Figure 2.3. The Inclusion of Nature in the Self scale. Participants were instructed to “please circle the picture below which best describes your relationship nature”. Adapted from Schultz (2002).
<table>
<thead>
<tr>
<th></th>
<th>Metapersonal Self-Construal scale</th>
<th>Connectedness to Nature scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>My personal existence is very purposeful and meaningful</td>
<td>I often feel a sense of oneness with the natural world around me</td>
</tr>
<tr>
<td>2</td>
<td>I believe that no matter where I am or what I’m doing, I am never separate from others</td>
<td>I think of the natural world as a community to which I belong</td>
</tr>
<tr>
<td>3</td>
<td>I feel a real sense of kinship with all living things</td>
<td>I recognize and appreciate the intelligence of other living organisms</td>
</tr>
<tr>
<td>4</td>
<td>My sense of inner peace is one of the most important things to me</td>
<td>I often feel disconnected from nature (reverse)</td>
</tr>
<tr>
<td>5</td>
<td>I take the time each day to be peaceful and quiet, to empty my mind of everyday thoughts</td>
<td>When I think of my life, I imagine myself to be part of a larger cyclical process of living</td>
</tr>
<tr>
<td>6</td>
<td>I believe that intuition comes from a higher part of myself and I never ignore it</td>
<td>I often feel a kinship with animals and plants</td>
</tr>
<tr>
<td>7</td>
<td>I feel a sense of responsibility and belonging to the universe</td>
<td>I feel as though I belong to the Earth as equally as it belongs to me</td>
</tr>
<tr>
<td>8</td>
<td>My sense of identity is based on something that unites me with all other people</td>
<td>I do have a deep understanding of how my actions affect the natural world</td>
</tr>
<tr>
<td>9</td>
<td>I am aware of a connection between myself and all living things</td>
<td>I often feel part of the web of life</td>
</tr>
<tr>
<td>10</td>
<td>I see myself as being extended into everything else</td>
<td>I feel that all inhabitants of Earth, human, and nonhuman, share a common ‘life force’</td>
</tr>
<tr>
<td>11</td>
<td></td>
<td>Like a tree can be part of a forest, I feel embedded within the broader natural world</td>
</tr>
<tr>
<td>12</td>
<td></td>
<td>When I think of my place on Earth, I consider myself to be a top member of a hierarchy that exists in nature (reverse)</td>
</tr>
<tr>
<td>13</td>
<td></td>
<td>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</td>
</tr>
<tr>
<td>14</td>
<td></td>
<td>My personal welfare is independent of the welfare of the natural world (reverse)</td>
</tr>
</tbody>
</table>

Note. M = mean; SD = standard deviation; Alpha = Cronbach’s alpha, of which a score of greater than 0.7 indicates good internal reliability; Metapersonal Self-Construal scale taken from DeCicco and Stroink (2007); Connectedness to Nature scale taken from Mayer and Frantz (2004). Both were presented as 7-point Likert scales from 1 (strongly disagree) to 7 (strongly agree).
Prosocial tendencies

Following Weinstein et al. (2009) a subset of the Aspirations Index (Kasser & Ryan, 1993; 1996) was used to measure a particular category of prosocial tendency, namely valuing contributing to the betterment of society and the lives of other people. In particular, the “community” items of the Intrinsic Aspirations subscale was used, which forms a measure that is here called community aspirations (Table 2.2). This measure works at an appropriate level of ProTs as it is human-centred, and therefore in line with the human-centred oneness primes. Although this measure of community aspirations does not include an environmental component, and therefore does not represent ProTs in general, the shorthand “ProTs” will still be used in this chapter for simplicity and to remain consistent with the general pattern of hypotheses tested throughout this thesis.

Table 2.2

Community Aspirations scale

<table>
<thead>
<tr>
<th>Prefix</th>
<th>Community Aspirations scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Work for the betterment of society</td>
</tr>
<tr>
<td>2</td>
<td>Assist people who need it, asking nothing in return</td>
</tr>
<tr>
<td>3</td>
<td>Work to make the world a better place</td>
</tr>
<tr>
<td>4</td>
<td>Help others improve their lives</td>
</tr>
<tr>
<td>5</td>
<td>Help people in need</td>
</tr>
</tbody>
</table>

| M      | 5.98 |
| SD     | 0.73 |
| Alpha  | 0.81 |

Note. M = mean; SD = standard deviation; Alpha = Cronbach’s alpha, of which a score of greater than 0.7 indicates good internal reliability; Community Aspirations scale taken from Intrinsic Aspirations subscale of the Aspirations index (Kasser & Ryan, 1993; 1996), presented as a 7-point Likert scale from 1 (strongly disagree) to 7 (strongly agree).

Socially desirable responding

Also following Weinstein et al. (2009), the Impression Management subscale of the Balanced Inventory of Desirable Responding (Paulhus, 1988) was included to control for the possibility that some participants over-estimated their level of ProTs to conform to their perceptions of the norms and ethics of the researchers.
2.2.2 Procedure

The students were already arranged into 20 laboratory streams for their course. Because there was a set of two control conditions for each of the two experimental conditions, plus one baseline condition, there were seven conditions in total: “real eyes”, “drawn eyes” and “chat” were the three conditions that formed the eye gaze set, and “infinite word cloud” (WC), “finite WC” and “no WC” formed the infinite values set of conditions. The two sets shared one baseline condition, in which participants completed the questionnaire without any preliminary task. Each of the 20 lab groups was randomly assigned to one condition, resulting in three lab groups per condition, with the exception of baseline, which was assigned to only 2 lab groups.

Each session was run by the primary researcher (Ties Coomber) and the tutor for that lab stream. Students were asked to sit at a computer and next to someone with whom they were unfamiliar, in order to form pairs of something approximating “strangers”. For the eye gaze set of conditions, students were asked to perform their assigned task, which was either a one minute silent eye gaze into their partner’s eyes, a one minute silent gaze into drawn eyes, or a one minute chat with their partner about what they are studying at university. The drawn eyes task was also done in pairs by sharing one drawing of eyes (see Appendix B) between the two partners. This ensured that the paired nature of the task was consistent across conditions. For the real eyes task, students were shown a positively valenced YouTube video of other people performing the task, so that they understood the intention behind the task (TheLiberatorsInternational, 2015). Although this might seem to unfairly inflate the kind of effect the eye gaze task was expected to produce, the point of this task was to reliably create an increase in oneness scores. Any effect found of eye gaze with a real person will be attributed to the entire task, which includes creating an appropriate setting and context for the task by playing the video.

For the infinite values set of conditions, the following blurb, based on Harré’s work (Harré et al., 2017; Harré, 2018), was used to ask students to generate three things of infinite value to them:

Please list three things that are of Infinite Value to you. Things of Infinite Value are things you might think of as sacred, precious or special; things that are of value for their own sake. They are things that you feel really make the world truly alive. Things of Infinite Value can be in any dimension, such as emotions, relationships, objects,
part of the natural world, or qualities. Another way of thinking of these is that they are the things that you value the most. If you would like to, please feel free to ask the experimenter any questions you may have about the task now.

Following this, they either completed the rest of the questionnaire (no WC condition), were shown the word cloud of the most commonly reported things of infinite value (infinite WC condition), or were shown the word cloud of the most commonly reported things of finite value while being led to believe that it was the infinite word cloud (finite WC condition). Both word clouds were the same as those used in Harré’s (2017) previous research (see Appendices A and C). For participants in the infinite and finite WC conditions, an open ended question followed the word cloud, in which they were asked to describe what it was like to be shown this word cloud. Then they completed the rest of the questionnaire. Participants in the baseline condition completed the questionnaire without any of these preliminary tasks.

The questionnaire was administered using the online program Qualtrics. It comprised the Inclusion of Other in the Self scale (IOS scale, only for participants in conditions that involved working in pairs), the Inclusion of Nature in the Self scale (INS scale), and the Inclusion of Humanity in the Self scale (IHS scale). These were all placed together at the start of the questionnaire because of their similar format. Following this, participants were presented, in randomized order, all items combined from the Connectedness to Nature scale (CTN scale), the Metapersonal Self-Construal scale (MSC scale), and the Balanced Inventory of Desirable Responding (BIDR). Participants were then asked to report their general mood (affect) using a 5-point, smiley face scale, which is a feature in Qualtrics. Participants were then asked not to discuss the lab session with other students until the lecture in the following week. This was to reduce the likelihood of students influencing other responses by revealing the different experimental conditions. In particular, it was important not to reveal the deception related to the finite WC condition. All students were fully debriefed in the lecture the following week, and a debrief letter was uploaded to the online student communication system immediately after the final lab session of the week.

To summarise the design, participants were assigned to either a oneness condition, a control condition, or the baseline condition. All participants completed a questionnaire packet that included measures of oneness and community aspirations. The causal relationship between oneness perceptions and prosocial tendencies was then able to be explored by testing...
whether oneness conditions were associated with greater community aspirations due to their
effects on oneness perceptions (as measured by the range of oneness measures used here).

2.2.3 Hypotheses

There were four broad hypotheses that formed the structure of a mediation analysis
based on the goal of this research, which was to demonstrate a causal relationship between
oneness and ProTs (see Figure 2.4). These four hypotheses are in line with the four
requirements of a mediation analysis as outlined by Baron and Kenny (1986).

1) Each of the oneness measures (IHS, INS, CTN, MSC) would be positively associated
with community aspirations (ProTs).

2) The average scores in each of the oneness measures would be higher in the two
experimental conditions (real eyes and infinite WC) compared to their respective
control conditions (drawn eyes, chat, and baseline for the real eyes condition, and
finite WC, no WC and baseline for the infinite WC condition).

3) The average community aspirations scores would be higher in the two experimental
conditions compared to their respective control conditions.

4) When the oneness measures were included in a model in which experimental
condition significantly predicts community aspirations, the significance of condition
would decrease while the significance of oneness would remain. If this fourth
hypothesis was confirmed, there would be evidence that changes in community
aspirations were caused by the experimentally manipulated changes in oneness (as
measured by the HIS, INS, CTN, and MSC scales). This fourth hypothesis required
that the first three hypotheses were supported.
2.3 Results

The results are presented in the following format, which is informed by the hypotheses of the research. In the general section, the data set as a whole is used (combining eye gaze and infinite values sets of conditions) to test whether the correlations between the oneness measures, and between the oneness measures and ProTs were positive and therefore consistent with previous research. Following this, both sets of conditions (eye gaze and infinite values) are analysed and reported separately.

For each of these sets of conditions, the results relating to the quantitative measures are reported in four parts: 1) an analysis of the relationships between the oneness measures and community aspirations (that is, a test of whether the oneness measures predict with community aspirations); 2) an analysis of the relationship between experimental condition and the oneness measures (that is, a test of whether the experimentally manipulated conditions have an effect on oneness scores); 3) an analysis of the relationship between condition and community aspirations (that is, a test of whether the experimentally manipulated conditions have an effect on the measure of ProTs); and 4) an analysis of the mediating effect of oneness on the relationship between experimental condition and community aspirations.

\[ \text{Experimental condition} \rightarrow \text{Oneness measures} \rightarrow \text{ProTs} \]

\[ H1, H2, H3, H4 \]

Figure 2.4. Schematic representation of the hypothesised mediation. Each arrow represents one hypothesis. ProTs = prosocial and pro-environmental tendencies; H1 = Hypothesis 1, H2 = Hypothesis 2, H3 = Hypothesis 3. Hypothesis 4 is that oneness partially mediates the effect of experimental condition on ProTs.
The results of the qualitative measures are reported separately, because they refer to a smaller subset of the data. In particular, in both data sets the baseline condition is excluded, and in the infinite values data sets the no WC condition is also excluded. This is because the open ended questions asked for descriptions of experiences related to only some conditions. These qualitative results are exploratory. However, they will still be related back to the general hypotheses, which is that experimental condition causes oneness which causes ProTs.

2.3.1 General

The general results combine data from both sets of conditions to test whether the general relationships between variables used in this research are consistent with the trends in the literature.

Relationships between oneness measures, and between oneness and ProTs

The correlations between the oneness scales when combining responses from all conditions were all positive and significant at the 0.001 level, except for the correlation between CTN scale and IHS scale, which was positive but only significant at the 0.05 level (see Table 2.3). Further, the correlations between the oneness scales and community aspirations were all positive and significant at the 0.001 level (except for the correlation with the INS scale, which was positive but significant at only the 0.05 level (see Table 2.3). The correlation results are consistent with the trend in the literature, namely a positive correlation between different oneness scales, and between oneness scales and measures of ProTs.
Table 2.3

Pearson correlations between measures of oneness and ProTs (n = 466)

<table>
<thead>
<tr>
<th></th>
<th>1. IHS</th>
<th>2. INS</th>
<th>3. MSC</th>
<th>4. CTN</th>
<th>5. CA</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. IHS</td>
<td>4.20</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4.00</td>
<td>1.44</td>
</tr>
<tr>
<td>2. INS</td>
<td>0.25 ***</td>
<td>4.36</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. MSC</td>
<td>0.33 ***</td>
<td>0.40 ***</td>
<td>4.56</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. CTN</td>
<td>0.12 *</td>
<td>0.56 ***</td>
<td>0.61 ***</td>
<td>4.61</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Community Aspirations</td>
<td>0.26 ***</td>
<td>0.11 *</td>
<td>0.34 ***</td>
<td>0.26 ***</td>
<td>5.98</td>
<td></td>
<td>0.73</td>
</tr>
</tbody>
</table>

Note. IHS = inclusion of humanity in the self; INS = inclusion of nature in the self; MSC = metapersonal self-construal; CTN = connectedness to nature; CA = community aspirations; M = mean; SD = standard deviation; correlation values are Pearson correlation coefficients; *p < 0.05, **p < 0.01, ***p < 0.001.

To explore the relationships further, regression analyses were run to test the extent to which each oneness measure predicted community aspirations when controlling for affect and socially desirable responding (see Table 2.4). These regression results suggest that each oneness measure on its own significantly and positively predicted community aspirations when controlling for affect (which was in some cases borderline significant) and socially desirable responding (BIDR, which was significant in all analyses). Further, when including all oneness measures in a single model, they all uniquely predicted community aspirations, although INS became a negative predictor variable when controlling for the others.
Table 2.4

Summary of multiple regression models for oneness variables predicting community aspirations (n = 466)

<table>
<thead>
<tr>
<th></th>
<th>1 IHS</th>
<th>2 INS</th>
<th>3 CTN</th>
<th>4 MSC</th>
<th>5 All</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(B)</td>
<td>(SE B)</td>
<td>(\beta)</td>
<td>(B)</td>
<td>(SE B)</td>
</tr>
<tr>
<td>(Intercept)</td>
<td>5.16</td>
<td>0.15</td>
<td>5.32</td>
<td>0.16</td>
<td>4.50</td>
</tr>
<tr>
<td></td>
<td>***</td>
<td>***</td>
<td>***</td>
<td>***</td>
<td>***</td>
</tr>
<tr>
<td>IHS</td>
<td>0.12</td>
<td>0.02</td>
<td>0.23</td>
<td>0.09</td>
<td>0.02</td>
</tr>
<tr>
<td>INS</td>
<td>0.05</td>
<td>0.02</td>
<td>0.09</td>
<td>-0.06</td>
<td>0.03</td>
</tr>
<tr>
<td>CTN</td>
<td>0.23</td>
<td>0.04</td>
<td>0.24</td>
<td>0.16</td>
<td>0.06</td>
</tr>
<tr>
<td>MSC</td>
<td>0.29</td>
<td>0.04</td>
<td>0.31</td>
<td>0.19</td>
<td>0.05</td>
</tr>
<tr>
<td></td>
<td>***</td>
<td>***</td>
<td>***</td>
<td>***</td>
<td>***</td>
</tr>
<tr>
<td>Affect</td>
<td>0.04</td>
<td>0.04</td>
<td>0.05</td>
<td>0.04</td>
<td>0.08</td>
</tr>
<tr>
<td>BIDR</td>
<td>0.04</td>
<td>0.01</td>
<td>0.16</td>
<td>0.04</td>
<td>0.01</td>
</tr>
<tr>
<td>Adj. (R^2)</td>
<td>0.09</td>
<td>0.05</td>
<td>0.10</td>
<td>0.13</td>
<td>0.16</td>
</tr>
<tr>
<td></td>
<td>***</td>
<td>***</td>
<td>***</td>
<td>***</td>
<td>***</td>
</tr>
</tbody>
</table>

Note. IHS = inclusion of humanity in the self; INS = inclusion of nature in the self; CTN = connectedness to nature; MSC = metapersonal self-construal; BIDR = Balanced Inventory of Desirable Responding; \(B\) = unstandardised regression coefficient; \(SE B\) = standard error of \(B\); \(\beta\) = standardised regression coefficient; \(+ p < 0.1, *p < 0.05, **p < 0.01, ***p < 0.001\).

Taken together, these general results suggest that the oneness measures are significantly positively correlated with each other and with community aspirations. All four oneness measures also predicted community aspirations when controlling for affect and BIDR. Further, all four measures uniquely predicted community aspirations when included in a single model, although INS was a negative predictor in this all-inclusive model. The positive relationship between oneness and ProTs is consistent with previous research and supports the first hypothesis.

### 2.3.2 Eye gaze

After having presented the relationships between the oneness measures, and between the oneness measures and community aspirations for the dataset as a whole, the focus is turned to analysing the two sets of conditions separately, starting with the eye gaze set.
Hypothesis H1: Relationships between oneness measures and between oneness and ProTs

The results in this section relate to H1 (Hypothesis 1), presented again for clarity in Figure 2.5 below.

In the subset of the data belonging to the eye gaze set of conditions, the correlations between all oneness measures, and between each oneness measure and community aspirations were all positive and significant (Table 2.5). The correlation results are consistent with previous research and with the correlations for the combined data set (eye gaze and infinite values sets of data) presented in the previous section. Each oneness measure was also found to positively and significantly predict community aspirations in multiple regression models controlling for affect and BIDR (Table 2.6). The regression results support the first hypothesis and satisfy the first of the requirements to perform a mediation analysis.

Figure 2.5. Schematic representation of the hypothesised mediation. Each arrow represents one hypothesis. ProTs = prosocial and pro-environmental tendencies; H1 = Hypothesis 1, H2 = Hypothesis 2, H3 = Hypothesis 3. Hypothesis 4 is that oneness partially mediates the effect of experimental condition on ProTs.
Table 2.5

Pearson correlations between measures of oneness and ProTs for the eye gaze set of conditions including baseline condition (n = 268)

<table>
<thead>
<tr>
<th></th>
<th>1. IHS</th>
<th>2. INS</th>
<th>3. MSC</th>
<th>4. CTN</th>
<th>5. CA</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. IHS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4.09</td>
<td>1.39</td>
<td></td>
</tr>
<tr>
<td>2. INS</td>
<td>0.34 ***</td>
<td></td>
<td></td>
<td></td>
<td>4.31</td>
<td>1.47</td>
<td></td>
</tr>
<tr>
<td>3. MSC</td>
<td>0.30 ***</td>
<td>0.43 ***</td>
<td></td>
<td></td>
<td>4.53</td>
<td>0.80</td>
<td></td>
</tr>
<tr>
<td>4. CTN</td>
<td>0.13 *</td>
<td>0.60 ***</td>
<td>0.62 ***</td>
<td></td>
<td>4.61</td>
<td>0.78</td>
<td></td>
</tr>
<tr>
<td>5. Community Aspirations</td>
<td>0.23 ***</td>
<td>0.19 **</td>
<td>0.31 ***</td>
<td>0.25 ***</td>
<td>5.97</td>
<td>0.71</td>
<td></td>
</tr>
</tbody>
</table>

Note. IHS = inclusion of humanity in the self; INS = inclusion of nature in the self; MSC = metapersonal self-construal; CTN = connectedness to nature; CA = community aspirations; M = mean; SD = standard deviation; correlation values are Pearson correlation coefficients; *p < 0.05, **p < 0.01, ***p < 0.001.

Table 2.6

Summary of multiple regression models for oneness variables predicting community aspirations for the eye gaze set of conditions including baseline condition (n = 268)

<table>
<thead>
<tr>
<th></th>
<th>1. IHS</th>
<th>2. INS</th>
<th>3. CTN</th>
<th>4. MSC</th>
<th>5. All</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>SE B</td>
<td>B</td>
<td>SE B</td>
<td>B</td>
</tr>
<tr>
<td>(Intercept)</td>
<td>5.17</td>
<td>0.20</td>
<td>5.21</td>
<td>0.21</td>
<td>4.56</td>
</tr>
<tr>
<td>IHS</td>
<td>0.11</td>
<td>0.03</td>
<td>0.21</td>
<td></td>
<td>0.08</td>
</tr>
<tr>
<td>INS</td>
<td></td>
<td></td>
<td></td>
<td>0.08</td>
<td>0.03</td>
</tr>
<tr>
<td>CTN</td>
<td></td>
<td></td>
<td>0.21</td>
<td>0.05</td>
<td>0.23</td>
</tr>
<tr>
<td>MSC</td>
<td></td>
<td></td>
<td></td>
<td>0.25</td>
<td>0.05</td>
</tr>
<tr>
<td>Affect</td>
<td>0.05</td>
<td>0.07</td>
<td>0.05</td>
<td>0.09</td>
<td>0.08</td>
</tr>
<tr>
<td>BIDR</td>
<td>0.03</td>
<td>0.01</td>
<td>0.14</td>
<td>0.03</td>
<td>0.13</td>
</tr>
<tr>
<td>Adj. R²</td>
<td>0.07</td>
<td>0.05</td>
<td>0.08</td>
<td>0.10</td>
<td>0.12</td>
</tr>
</tbody>
</table>

Note. IHS = inclusion of humanity in the self; INS = inclusion of nature in the self; MSC = metapersonal self-construal; CTN = connectedness to nature; CA = community aspirations; M = mean; SD = standard deviation; correlation values are Pearson correlation coefficients; *p < 0.05, **p < 0.01, ***p < 0.001. 
Hypothesis H2) Effect of condition on oneness measures

These results relate to the H2 path of Figure 2.5 above. A MANOVA analysis was used to test for an effect of condition (real eyes, drawn eyes, chat, and baseline) on the combination of our four oneness measures (IHS, INS, CTN, and MSC). The results of the MANOVA found no significant difference in oneness between conditions, Pillai’s trace (3, 263) = 0.04, $F(12, 786) = 0.83, p = 0.62$. Nonetheless, owing to the exploratory nature of this research, ANOVAs were run for all four oneness measures.

Out of the four ANOVAs run, no oneness measure was found to differ significantly across conditions, with the exception of the CTN scale, which was found to differ borderline significantly across conditions, $F(3, 264) = 2.28, p = 0.08$. Post hoc Tukey tests on the difference in CTN scores between all possible pairs of conditions found that the mean CTN score for the drawn eyes condition ($M = 4.71, SD = 0.72$) was borderline significantly greater than that for the baseline condition ($M = 4.36, SD = 0.86$), $p = 0.07$. The differences in mean CTN scores between all others pairs of conditions were not even borderline significant. This suggests that gazing into a pair of drawn eyes produced significantly greater connectedness to nature compared to doing no task, but not compared to gazing into a stranger’s eyes or chatting with a stranger. H2 was therefore not supported.

The effects of condition on the measure of oneness between specific pairs of participants (the Inclusion of Other in the Self scale) was analysed separately because it required removing the baseline condition in which participants did not perform any tasks in pairs. An ANOVA was performed to test whether IOS scores differed across three conditions (real eyes, drawn eyes, and chat). The results found a significant main effect of condition on IOS scores, $F(2, 216) = 4.71, p = 0.01$. A post-hoc Tukey test revealed significant differences in IOS scores between real eyes and drawn eyes, and between chat and drawn eyes. In particular, the mean IOS score for real eyes ($M = 2.97, SD = 1.45$) was significantly greater than that for drawn eyes ($M = 2.41, SD = 1.50$), $p = 0.05$, and the mean IOS score for chat ($M = 3.11, SD = 1.46$) was significantly larger than that for drawn eyes, $p = 0.01$.

Taken together, these results suggest that eye gaze with a stranger does not appear to be an effective general oneness prime as measured by the IHS scale, INS scale, CTN scale, and MSC scale in this experimental setting. The second requirement for running a mediation analysis was therefore not met. A sensitivity analysis was run using the power calculator “G*Power” (Faul et al., 2007), which found that the main MANOVA analysis run in this
section required only a small effect size of Cohen’s $f^2 = 0.02$ (Selya et al., 2012) in order to achieve an adequate power of 0.8 (J. Cohen, 1992). The analysis was therefore sufficiently sensitive to detect even small effects.

Finally, although the real eyes condition was associated with greater IOS scores (i.e., oneness with the exercise partner) compared to that in the drawn eyes condition, this was not greater than simply chatting to the partner, which was also found to produce significantly greater IOS scores than the drawn eyes condition. The eye gaze task therefore seems to increase IOS scores to a similar extent as chatting with the stranger. This is not to say that participants necessarily experience the two tasks in the same way, but rather that the single item, pictorial format of the IOS scale captures the effects of these two tasks to a similar extent.

Hypothesis H3) Effect of condition on community aspirations

These results relate to the H3 path of Figure 2.5 above. Although eye gaze did not seem to be an effective oneness prime, the possibility that it promoted community aspirations was still explored. The results of an ANOVA testing for differences in community aspirations across condition (real eyes, drawn eyes, chat and baseline) did not find a significant main effect. This suggests that the eye gaze task did not influence community aspirations.

Hypothesis H4) Oneness mediates the relationship between condition and community aspirations

This section was intended to test whether the effect of the experimental condition (real eyes) on community aspirations was explained through the effect of real eyes on oneness. However, because there was no effect of condition on community aspirations, this mediation could not be tested.

Open ended responses

Given the relatively exploratory nature of this research, participants were asked to describe their experience of their respective tasks. Open ended responses were coded to capture the extent to which people used language that represented a sense of connecting with the other person. These were formed into a continuous variable comprising 4 levels – not
relational, relational, strongly relational, and metarelational. The analyses presented here exclude the baseline condition, because participants in the baseline condition performed no task to report back on. The coded qualitative variable did not significantly correlate with any of the four quantitative oneness measures (IHS, INS, CTN, and MSC), suggesting that it measures something different or perhaps more general. However, the coded qualitative variable was significantly positively correlated with community aspirations, $r = 0.21, p < 0.01$.

An ANOVA analysis was used to test for differences in mean relational scores by condition (eye gaze, real eyes, and chat). The results of the ANOVA found that this coded qualitative variable did not vary by condition, $F(2, 215) = 2.00, p = 0.14$. Taken together these results suggest that people do not spontaneously report stronger feelings of connection following an eye gaze task with a stranger compared to chatting with a stranger or gazing into drawn eyes with a stranger. Consistent with the general trend in the literature, participants who reported a greater degree of connection also scored higher on community aspirations. However, a causal direction cannot be inferred because the experimental primes were not effective at inducing higher oneness or community aspiration scores.

### 2.3.3 Infinite values

The same approach applied to the eye gaze set of conditions was applied to the infinite values set of conditions. The results are reported below.

**Hypothesis H1) Relationships between oneness measures and between oneness and ProTs**

These results relate to the H1 path of Figure 2.6 below.
In the subset of the data belonging to the infinite values set of conditions, the correlations between all oneness measures, and between each oneness measure and community aspirations were all positive and significant, with the exceptions of the correlations between INS and community aspirations (not significant) and between CTN and HIS (borderline significant) (Table 2.7). Apart from the one unusual non-significant relationship, these results are consistent with previous research and with the correlations for the combined data set (eye gaze and infinite values sets of data). Each oneness measure, except for INS, was also found to positively and significantly predict community aspirations in multiple regression models controlling for affect and BIDR (Table 2.8). The regression results on the whole support the first hypothesis and satisfy the first of the requirements to perform a mediation analysis, with the exception of INS.

Figure 2.6. Schematic representation of the hypothesised mediation. Each arrow represents one hypothesis. ProTs = prosocial and pro-environmental tendencies; H1 = Hypothesis 1, H2 = Hypothesis 2, H3 = Hypothesis 3. Hypothesis 4 is that oneness partially mediates the effect of experimental condition on ProTs.
Table 2.7

**Pearson correlations between measures of oneness and ProTs for the infinite values set of conditions including baseline condition (n = 247)**

<table>
<thead>
<tr>
<th></th>
<th>1. IHS</th>
<th>2. INS</th>
<th>3. MSC</th>
<th>4. CTN</th>
<th>5. CA</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. IHS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. INS</td>
<td>0.13 *</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. MSC</td>
<td>0.37 ***</td>
<td>0.36 ***</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. CTN</td>
<td>0.11 +</td>
<td>0.51 ***</td>
<td>0.61 ***</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Community Aspirations</td>
<td>0.28 ***</td>
<td>0.05</td>
<td>0.36 ***</td>
<td>0.28 ***</td>
<td>5.99</td>
<td>0.74</td>
<td></td>
</tr>
</tbody>
</table>

*Note*. IHS = inclusion of humanity in the self; INS = inclusion of nature in the self; MSC = metapersonal self-construal; CTN = connectedness to nature; CA = community aspirations; M = mean; SD = standard deviation; correlation values are Pearson correlation coefficients; +$p<0.1$, *$p<0.05$, **$p<0.01$, ***$p<0.001$.

Table 2.8

**Summary of multiple regression models for oneness variables predicting community aspirations for the infinite values set of conditions including baseline condition (n = 247)**

<table>
<thead>
<tr>
<th></th>
<th>1 IHS</th>
<th>2 INS</th>
<th>3 CTN</th>
<th>4 MSC</th>
<th>5 All</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Intercept)</td>
<td>5.23</td>
<td>5.49</td>
<td>4.45</td>
<td>4.32</td>
<td>4.03 ***</td>
</tr>
<tr>
<td>IHS</td>
<td>0.13</td>
<td>0.20</td>
<td>0.25</td>
<td>0.09 **</td>
<td>0.03</td>
</tr>
<tr>
<td>INS</td>
<td>0.02</td>
<td>0.03</td>
<td>0.05</td>
<td>-0.08 *</td>
<td>0.04</td>
</tr>
<tr>
<td>CTN</td>
<td>0.26</td>
<td>0.06</td>
<td>0.23</td>
<td>0.19 *</td>
<td>0.08</td>
</tr>
<tr>
<td>MSC</td>
<td>0.32</td>
<td>0.06</td>
<td>0.34</td>
<td>0.20 **</td>
<td>0.07</td>
</tr>
<tr>
<td>Affect</td>
<td>0.01</td>
<td>0.05</td>
<td>0.01</td>
<td>0.05</td>
<td>0.05</td>
</tr>
<tr>
<td>BIDR</td>
<td>0.04</td>
<td>0.02</td>
<td>0.14</td>
<td>0.05</td>
<td>0.02</td>
</tr>
<tr>
<td>Adj. $R^2$</td>
<td>0.08</td>
<td>0.02</td>
<td>0.10</td>
<td>0.14</td>
<td>0.18</td>
</tr>
</tbody>
</table>

*Note*. IHS = inclusion of humanity in the self; INS = inclusion of nature in the self; MSC = metapersonal self-construal; BIDR = Balanced Inventory of Desirable Responding; $B$ = unstandardised regression coefficient; $SE B$ = standard error of $B$; $\beta$ = standardised regression coefficient; +$p<0.1$, *$p<0.05$, **$p<0.01$, ***$p<0.001$.)
Hypothesis H2) Relationship between condition and oneness measures

These results relate to the H2 path in Figure 2.6 above. A MANOVA analysis was used to test for an effect of condition (infinite WC, finite WC, no WC, and baseline) on the combination of our four oneness measures (IHS, INS, CTN, and MSC). The results of the MANOVA found no significant difference in oneness between conditions, Pillai’s trace (3, 243) = 0.04, $F(12, 726) = 0.90$, $p = 0.5$. Nonetheless, owing to the exploratory nature of this research, ANOVAs were run for all four oneness measures, testing whether their respective averages differed across condition. Not one of the ANOVAs found a significant main effect of condition on its respective oneness measure. The second requirement for a mediation analysis was therefore not met.

A sensitivity analysis was run using the power calculator “G*Power” (Faul et al., 2007), which found that the main MANOVA analysis run in this section required only a small effect size of Cohen’s $f^2 = 0.02$ (Selya et al., 2012) in order to achieve an adequate power of 0.8 (J. Cohen, 1992). The analysis was therefore sufficiently sensitive to detect even small effects.

Hypothesis H3) Effect of condition on community aspirations

These results relate to the H3 path of Figure 2.6 above. Although the infinite WC task did not seem to be an effective oneness prime (as suggested by the non-significant MANOVA results reported above), the possibility was still explored that it promoted ProTs. The results of an ANOVA testing for differences in community aspirations across condition (infinite WC, finite WC, no WC, and baseline) did not find a significant main effect. This suggests that a revelation of shared infinite values did not promote community aspirations. The third requirement for a mediation analysis was therefore also not met.

Hypothesis H4) Oneness mediates the relationship between condition and community aspirations

This section was intended to test whether the effect of the experimental condition (infinite WC) on community aspirations was explained through the effect of the infinite WC condition on oneness. However, because there was no effect of condition on community aspirations, this mediation could not be tested.
Open ended responses

Given the relatively exploratory nature of this research, participants who were shown either of the two word clouds were asked to describe how it felt to be shown them. Coding these responses with respect to their potential oneness content provided another measure of the psychological effects of this experimental manipulation. Given that only two groups were shown word clouds, these results relate only to the infinite WC experimental condition and the finite WC control condition.

The open ended responses were coded with respect to whether the participant mentioned the similarity or difference between the displayed word cloud and their three things of infinite value that they generated in the preliminary task. This created three binary variables – mention, similar, and different. In the first, those who compared the word cloud to their things of infinite value were scored a 1, and those who did not mention such a comparison were scores a 0. In the second, those who commented on the similarity between the word cloud and their things of infinite value were scored a 1, and those who did not comment on similarity were scored a 0. In the final, those who commented on the difference between the word cloud and their things of infinite value were scored a 1, and those who did not comment on the difference were scored a 0. Participants who commented on both similarities and differences were not included in the analysis, providing a more stark contrast between those who noted similarity and those who noted differences. Previous research (Harré et al., 2017) suggested that a common response to being shown the infinite WC is a sense of belonging to a common humanity. Here reported similarity with respect to most other people’s things of infinite value is taken to represent the same kind of belonging to a common humanity – i.e., a sense of fundamental similarity with other people.

The results of a chi-square test (see Table 2.9) revealed that there was a significant association between condition and presence of similarity, $\chi^2(1, n = 103) = 55.92$, $p < 0.001$. In particular, there was a significantly greater frequency of “similar” scores in the infinite WC condition compared to the finite WC condition. Similarly, reporting differences with respect to shared things of infinite value was significantly associated with the finite WC condition, $\chi^2 (1, n = 103) = 71.70$, $p < 0.001$. Finally, mentioning the word cloud at all in the open ended responses was significantly associated with the finite WC condition over the infinite WC condition, $\chi^2(1, n = 126) = 14.07$, $p < 0.001$. 
These results from the qualitative data suggest that on the whole people were surprised when they were shown the finite WC and were told it was the infinite WC (suggested by the higher frequency of mentioning the word cloud in the finite WC condition). They also suggest that people shown the infinite WC were more likely to feel similar with respect to things that are of ultimate importance in life compared to those in the finite WC condition; and people shown the finite WC were more likely to feel different with respect to things that are of ultimate importance in life compared to those in the infinite WC condition. This confirms that people do relate to the infinite values presented in the word cloud, and that they consider them to be congruent with their own things of infinite value. However, this strong effect of condition on coded qualitative data is inconsistent with the lack of effect of condition on the quantitative oneness scales.

Table 2.9

Summary of three chi-square tests for associations between type of word cloud and reporting of similarity, reporting of difference, and mention of word cloud

<table>
<thead>
<tr>
<th></th>
<th>Infinite WC</th>
<th>Finite WC</th>
<th>Chi-square test of independence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reporting of similarity</td>
<td>26</td>
<td>0</td>
<td>$\chi^2 (1) = 55.92$</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>$p &lt; 0.001$</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>$n = 103$</td>
</tr>
<tr>
<td>No reporting of similarity</td>
<td>12</td>
<td>65</td>
<td></td>
</tr>
<tr>
<td>Reporting of difference</td>
<td>3</td>
<td>61</td>
<td>$\chi^2 (1) = 71.70$</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>$p &lt; 0.001$</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>$n = 103$</td>
</tr>
<tr>
<td>No reporting of difference</td>
<td>35</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Mention of word cloud</td>
<td>38</td>
<td>65</td>
<td>$\chi^2 (1) = 14.07$</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>$p &lt; 0.001$</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>$n = 126$</td>
</tr>
<tr>
<td>No mention of word cloud</td>
<td>19</td>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>

Note. WC = word cloud; $\chi^2$ = chi-square statistic
To explore this inconsistency, it was tested whether the presence of a sense of similarity predicts scores on the established oneness scales. Logistic regressions were run modelling the binary similarity variable as a function of the four quantitative oneness measures, controlling for affect and BIDR. The results found that no oneness measure was significantly associated with the presence of a similar score. This suggests that a reported sense of similarity with respect to infinite values was not associated with scores on established oneness measures. Similarly, the results of a single logistic regression found that community aspiration scores were not significantly associated with the presence of a similar score, controlling for affect and BIDR.

Taken together, there was an effect of condition on similarity scores, but no relationship between similarity scores and oneness measures, nor between similarity scores and community aspirations.

2.4 Discussion

The pilot study was an attempt to test for a causal relationship between oneness and ProTs. The effects of two novel oneness primes were tested on a range of established oneness measures and the ProT of community aspirations, treating the oneness measures as potential mediators between the oneness primes and community aspirations. The four broad hypotheses were: H1) all four oneness measures will predict community aspirations; H2) the two experimental conditions will predict greater oneness scores on average compared to their respective control conditions; H3) the two experimental conditions will predict greater community aspiration scores on average compared to their respective control conditions; H4) oneness scores will partially mediate the relationship between the experimental conditions and community aspirations.

For the eye gaze set of conditions, only H1 was supported. This confirmed the general trend in the literature, namely that oneness is positively associated with ProTs. It also contributes the Inclusion of Humanity in the Self scale as a novel measure of oneness with humanity, supporting its utility with the result that it predicted community aspirations. As H2 and H3 were not supported, H4 could not be tested. These inconsistencies between the results and the hypotheses were surprising, because the anecdotal evidence for the effects of the eye gaze task on psychological phenomena approximating those captured by the oneness
measures used here was convincing. This incongruence could be due to the task being
difficult to set up the task in a classroom environment in such a way that it will reliably
induce the kinds of feelings that it seems to produce in other contexts. Indeed, according to
the open ended responses from this study, some participants found the task somewhat
aversive, and many seemed to find it awkward. In addition, the positive effects of the task
could have been overemphasised in popular media reports. For example, the YouTube videos
and other sources referenced in the introduction might have focused only on people who
reported to have a profoundly positive, connecting experience, ignoring those who did not
have such an experience.

Related to this is a possible self-selection bias in the popular accounts of the oneness
effects of eye gaze tasks. That is, the public eye gaze events that featured on Facebook and
YouTube might appeal only to people who expect to feel positive, prosocial emotions like
empathy and a sense of connection. If only those people attend those events, then the positive
effects of the task might not necessarily generalise to people who are not drawn to these kinds
of events. Because this task was presented here to a random sample of undergraduate
psychology students, the possibility of self-selection bias was eliminated, and therefore the
possibility of having a large proportion of participants who did not find it a profoundly
connecting experience was increased. In addition to this, the average age of the participants in
the pilot study was likely to be lower than those in the YouTube videos and the public events.
To take the task seriously requires being relatively “emotionally mature”, and 18-19 year olds
in their first year of university may still be developing that capacity.

Another possibility is that the oneness effects of the task were not adequately captured
by the pre-existing oneness scales used here. This could be either because the scope of the
scales (e.g., humanity, nature, all of existence) are too broad for a task that is carried out
between just two people. There is some evidence for this. Namely, although the real eyes task
did not produce an effect on general oneness measures compared to the control conditions, it
did produce greater scores on average in the Inclusion of Other in the Self (IOS) scale, which
just measures the connection between two individuals. However, this effect was found only
in comparison to the drawn eyes condition. Simply chatting to a partner produced a similar
increase in IOS scores compared to drawn eyes. Even though chatting and gazing into
another’s eyes are likely to be quite different experiences, the relatively abstract nature of the
IOS scale appears to pick up increases in whatever kinds of connection produced by both
tasks. The variety in how the overlapping circles used in the IOS is interpreted has been previously examined by Aron et al. (1992).

Another way that the scales might not capture the oneness effects of the task, beyond just the broad scope of the scales, is in the specific language and concepts used to describe the oneness connections in the scale items. As already noted, the meaning of the visual metaphor of overlapping circles is open to interpretation. In addition, regarding the scales with multiple verbal items, there is reference to seemingly distinct concepts even within a given scale. For example, the Metapersonal Self-Construal (MSC) scale includes the following items: “I take the time each day to be peaceful and quiet, to empty my mind of everyday thoughts”; “My personal existence is very purposeful and meaningful”; “I feel a real sense of kinship with all living things”; and “I feel a sense of responsibility and belonging to the universe”. The first two of these items do not refer to perceptions of oneness per se, and the second two (beyond just the difference in scope) refer to kinship and responsibility respectively, which would appear to represent two different concepts.

Chapter 3 of the current thesis presents a review of the related literature and proposes a typology to help understand the many and varied oneness concepts. The typology distinguishes between different types of perceived connection between self and other. Namely, self-expansion (expansion), shared essence (essential), and interdependence, where interdependence contrasts with expansion in that it involves seeing the self as a small part of a larger whole rather than the larger whole itself. Droseltis and Vignoles (2010) made similar distinctions for the place identity literature. The items in the CTN and MSC scales seem to refer to multiple of these potential types of oneness (and different concepts altogether, like behaviours). It is possible, therefore, that the eye gaze task produced feelings of a particular kind of oneness, and that this effect was not picked up because the items that measure that type of oneness in a given scale were diluted with items measuring other concepts. Future research on oneness might wish to consider these kinds of distinctions when deciding on which measures or items to use.

Unfortunately the language used spontaneously by the participants to describe their experience of the eye gaze task also did not provide any evidence of a oneness effect of the eye gaze task, as people reported similar feelings of connection with the chatting task as with the eye gaze task. This could be because these feelings are difficult for participants to describe on the spot, difficult for researchers to code, or a combination of both. These are
complicated concepts, and the ability to articulate them freely is likely to come only with contemplation over a longer time period than the time provided for an open ended question in an undergraduate laboratory session. Future research would benefit from in depth qualitative research with people who have already contemplated how their individual lives are connected to broader aspects of existence, like humanity and nature. Alternatively, carefully worded, verbal scales based on the kinds of distinctions described in the oneness typology in Chapter 3 of the current thesis might be necessary for more general studies with large numbers of participants. The latter may be preferred for a concept like oneness, as it is easier to relate to concepts and metaphors than it is to generate them.

Regarding the infinite values set of conditions, only H1 was supported, namely that oneness predicts ProTs. H2 and H3 were not supported, so H4 could not be tested. It seems, therefore, that generating three things of infinite value, then being shown a word cloud of the most common responses does not produce a sense of oneness that is measured by the scales used here. It was hypothesised that this task would be an effective prime because previous research found that it produced a sense of belonging to a common humanity (Harré et al., 2017). Either it failed to do that in the current study, or the oneness measures used did not adequately capture the oneness effects of the task. The open ended responses suggest that the task was significantly associated with a higher frequency of recognising similarity between one’s own things of infinite value and those displayed by the word cloud. The information that “you are similar to most people with respect to what is of ultimate importance in life” therefore did register, so it is reasonable to believe that the scales may not be sufficiently valid for the purposes of this study. The potential inadequacies in the scales have already been outlined in the discussion of the eye gaze results above.

The important common theme across both sets of conditions was that the experimental conditions had no effect on oneness as operationally defined by the measures used, and that improving the measures might at least partly resolve this negative result. As a preliminary test of this possibility, a follow-up analysis was conducted in which the data were re-analysed after rearranging the scale items to reflect two aspects of the oneness typology (Chapter 3 of the current thesis). The typology highlights that the way oneness concepts in the literature are described and measured can be classified according to three kinds of connection – *expansion, essential*, and *interdependence*. *Expansion* connections refer to those in which the other is perceived to be part of the self; *essential* connections refer to those in which the other is perceived to share an essence (be it spiritual or physical) with the self; and
interdependence connections refer to those in which self and other are saliently perceived to form a larger, interacting whole, as in an ecosystem. Importantly, an analysis of existing oneness measures presented in Chapter 3 noted that most scales include items across at least two of these types of oneness, thereby conflating potentially distinct concepts. Indeed, the two multi-item scales used here (CTN and MSC scales) include items that refer to essential and interdependence connections, as well as other concepts that may be related to oneness but do not directly measure oneness as such. The follow-up analysis presented in Study 1b below describes how the existing scale items from the first study were rearranged to represent the novel concepts, then presents the results of re-analysing the same data set from the first study using the re-arranged measures.

2.5 Study 1b – re-analysing the data

The items from the two oneness measures (Metapersonal Self-Construal and Connectedness to Nature scales) were arranged according to whether they refer to an essential oneness connection or an interdependence oneness connection. The expansion oneness connection was not included here because none of the items in these two scales refer specifically to an expansion oneness connection.

Arranging the items according to whether they refer to essential or interdependence oneness connections produced the following two sets of items. The scale from which the item was taken is written in parentheses next to each item.

Essential
- I feel a real sense of kinship with all living things (MSC)
- I often feel a kinship with animals and plants (CNS)
- I feel that all inhabitants of Earth, human, and non-human, share a common “life force” (CNS)
Interdependence

- I think of the natural world as a community to which I belong (CNS)
- When I think of my life, I imagine myself to be a part of a larger cyclical process of living (CNS)
- I have a deep understanding of how my actions affect the natural world (CNS)
- I often feel part of the web of life (CNS)
- Like a tree can be part of a forest, I feel embedded within the broader natural world (CNS)
- 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 (CNS)
- My personal welfare is independent of the welfare of the natural world (CNS, reverse score)

Cronbach’s alpha was calculated for these measures, deleting the items whose deletion increased the Cronbach’s alpha score. After performing these reliability analyses on these two variables, the final composition of the two variables were as follows (see Table 2.10).

Table 2.10

<table>
<thead>
<tr>
<th>Essential</th>
<th>Interdependence</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>I feel a real sense of kinship with all living things (MSC)</td>
</tr>
<tr>
<td>2</td>
<td>I often feel a kinship with animals and plants (CNS)</td>
</tr>
<tr>
<td>3</td>
<td>I feel that all inhabitants of Earth, human, and non-human, share a common ‘life force’ (CNS)</td>
</tr>
<tr>
<td>4</td>
<td>Like a tree can be part of a forest, I feel embedded within the broader natural world (CNS)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Essential</th>
<th>Interdependence</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>4.67</td>
<td>4.52</td>
</tr>
<tr>
<td>SD</td>
<td>1.12</td>
<td>1.03</td>
</tr>
<tr>
<td>Alpha</td>
<td>0.68</td>
<td>0.77</td>
</tr>
</tbody>
</table>

Note. M = mean; SD = standard deviation; Alpha = Cronbach’s alpha, of which a score of greater than 0.7 indicates good internal reliability. The brackets contain the original source of a given item; CNS = Connectedness to Nature scale (Mayer & Frantz, 2004), and MSC = Metapersonal Self-Construal scale (DeCicco & Stroink, 2007).
A measure was also created that was comprised of items that referred to oneness or connection in general. If essential and interdependence connections are two examples of oneness connections, then they should both be positively associated with items referring to oneness with nature in general.

**General Oneness**

- I am aware of a connection between myself and all living things (MSC)
- I often feel a sense of oneness with the natural world around me (CNS)
- The Inclusion of Nature in the Self scale
- The Inclusion of Humanity in the Self scale

After performing a reliability analysis on this general oneness factor, the Inclusion of Humanity in the Self scale was removed to improve the Cronbach’s alpha value from 0.67 to 0.75, with a mean of 4.55 and standard deviation of 1.16. Doing so removed the only specifically human-centred item from the General Oneness scale. It will remain labelled as general oneness, as it does not distinguish between essential and interdependence types. However, it is worth noting that the three remaining items refer to nature/all living things.

### 2.5.1 Hypotheses

The hypotheses for the follow-up analysis were roughly the same as the first two hypotheses in the initial study. However, because the initial study already found that a mediation analysis as not possible, owing to of the lack of a significant association between condition and community aspirations, the follow-up analysis focused only on the effect of condition on the two new oneness measures (essential and interdependence), and on the relationship between these new oneness measures/with community aspirations.

1) **Essential and interdependence** will be positively associated with each other, with general oneness, and with community aspirations.

2) The average essential and interdependence scores will be higher in the two experimental conditions (real eyes and infinite WC) compared to their respective control conditions (drawn eyes, chat, and baseline for the real eyes condition, and finite WC, no WC, and baseline for the infinite WC condition).
It is worth noting that this research did not intend to establish discriminant validity of these two novel types of oneness. Given that these measures were created within the constraints of the items that already exist within the Connectedness to Nature scale and Metapersonal Self-Construal scale, rather than administering a range of items that were designed to distinguish between the two kinds of oneness, the follow-up analysis is considered to be just an exploratory pilot use of some of the concepts put forward in the oneness typology presented in Chapter 3 of the current thesis. Doing so also allows for a more thorough test of the two potential oneness primes used with this group of participants. The hypotheses reflect this, as they do not specify an expected difference between essential and interdependence scores. Instead, the hypotheses allow that the two concepts behave roughly the same in this context, despite accepting the theoretical presupposition that they are conceptually distinct. Future research will be needed to provide evidence for their distinctiveness (such research is presented in Chapter 5 of the current thesis).

2.5.2 Results

2.5.2.1 General

Essential and interdependence scores were significantly positively correlated with each other and with general oneness (see Table 2.11). They were also both significantly positively correlated with community aspirations, as was general oneness. This is consistent with the general trend in the literature demonstrating a positive relationship between oneness measures and ProTs.

Table 2.11

<table>
<thead>
<tr>
<th></th>
<th>1. Ess</th>
<th>2. Int</th>
<th>3. One</th>
<th>4. CA</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Essential</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4.67</td>
<td>1.12</td>
</tr>
<tr>
<td>2. Interdependence</td>
<td>0.66***</td>
<td></td>
<td></td>
<td></td>
<td>4.52</td>
<td>1.03</td>
</tr>
<tr>
<td>3. Oneness</td>
<td>0.72***</td>
<td>0.68***</td>
<td></td>
<td></td>
<td>4.55</td>
<td>1.16</td>
</tr>
<tr>
<td>4. Community aspirations</td>
<td>0.23***</td>
<td>0.27***</td>
<td>0.17***</td>
<td></td>
<td>5.98</td>
<td>0.73</td>
</tr>
</tbody>
</table>

Note. M = mean; SD = standard deviation; correlation values are Pearson correlation coefficients, *p < 0.05, **p < 0.01, ***p < 0.001.
The positive relationship between oneness measures and ProTs also held for essential, interdependence, and general oneness scores when predicting community aspirations in separate regression models, controlling for affect and BIDR (see Table 2.12). However, when including essential, interdependence, and general oneness in a single regression model, controlling for affect and BIDR, only essential and interdependence scores remained significant predictors of community aspirations, suggesting they each measure something unique beyond just general oneness. These results suggest that both interdependence and essential oneness uniquely predict community aspirations, controlling for social desirability and affect.

Table 2.12
Summary of multiple regression models for novel oneness variables predicting community aspirations (n = 466)

<table>
<thead>
<tr>
<th></th>
<th>1 Ess</th>
<th>2 Int</th>
<th>3 Oneness</th>
<th>4 All</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Intercept)</td>
<td>4.87</td>
<td>4.81</td>
<td>5.07</td>
<td>4.73</td>
</tr>
<tr>
<td></td>
<td>***</td>
<td>***</td>
<td>***</td>
<td>***</td>
</tr>
<tr>
<td>Essential</td>
<td>0.14</td>
<td>0.03</td>
<td>0.09</td>
<td>0.04</td>
</tr>
<tr>
<td></td>
<td>***</td>
<td></td>
<td></td>
<td>0.13</td>
</tr>
<tr>
<td>Interdependence</td>
<td>0.18</td>
<td>0.03</td>
<td>0.15</td>
<td>0.05</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.21</td>
</tr>
<tr>
<td>General Oneness</td>
<td>0.10</td>
<td>0.03</td>
<td>-0.05</td>
<td>0.04</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-0.08</td>
</tr>
<tr>
<td>Affect</td>
<td>0.07</td>
<td>0.05</td>
<td>0.05</td>
<td>0.03</td>
</tr>
<tr>
<td></td>
<td>*</td>
<td></td>
<td></td>
<td>0.07</td>
</tr>
<tr>
<td>BIDR</td>
<td>0.04</td>
<td>0.04</td>
<td>0.01</td>
<td>0.01</td>
</tr>
<tr>
<td></td>
<td>***</td>
<td>***</td>
<td>***</td>
<td>***</td>
</tr>
<tr>
<td>Adj. R²</td>
<td>0.09</td>
<td>0.10</td>
<td>0.07</td>
<td>0.10</td>
</tr>
<tr>
<td></td>
<td>***</td>
<td>***</td>
<td>***</td>
<td>***</td>
</tr>
</tbody>
</table>

Note. Ess = essential model; Int = interdependence model; Oneness = general oneness model; All = all oneness predictors in one model; B = unstandardised regression coefficient; SE B = standard error of B; β = standardised regression coefficient; +p < 0.1, *p < 0.05, **p < 0.01, ***p < 0.001).

2.5.2.2 Eye gaze
Hypothesis H1) Relationships between oneness measures and between oneness and ProTs

Consistent with the correlation results for the whole data set (all infinite values conditions and all eye gaze conditions), both essential and interdependence correlated with each other and with community aspirations for just the eye gaze set of conditions (see Table
In addition, in separate regression models, scores for both types of oneness measure predicted community aspirations when controlling for affect and BIDR (see Table 2.14). This supports H1 from Study 1b.

### Table 2.13

**Pearson correlations between measures of oneness and ProTs for the eye gaze set of conditions including baseline condition (n = 268)**

<table>
<thead>
<tr>
<th></th>
<th>1. Ess</th>
<th>2. Int</th>
<th>3. CA</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Essential</td>
<td></td>
<td></td>
<td></td>
<td>4.61</td>
<td>1.13</td>
</tr>
<tr>
<td>2. Interdependence</td>
<td>0.67 ***</td>
<td></td>
<td></td>
<td>4.50</td>
<td>1.02</td>
</tr>
<tr>
<td>5. Community Aspirations</td>
<td>0.20 **</td>
<td>0.23 ***</td>
<td></td>
<td>5.97</td>
<td>0.71</td>
</tr>
</tbody>
</table>

*Note. M = mean; SD = standard deviation; correlation values are Pearson correlation coefficients, *p < 0.05, **p < 0.01, ***p < 0.001.*

### Table 2.14

**Summary of multiple regression models for novel oneness variables predicting community aspirations for the eye gaze set of conditions including baseline condition (n = 268)**

<table>
<thead>
<tr>
<th></th>
<th>1 Ess</th>
<th>2 Int</th>
<th>3 All</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Intercept)</td>
<td>4.96</td>
<td>4.90</td>
<td>4.83</td>
</tr>
<tr>
<td></td>
<td>***</td>
<td>***</td>
<td>***</td>
</tr>
<tr>
<td>Essential</td>
<td>0.12 **</td>
<td>0.15 ***</td>
<td>0.05</td>
</tr>
<tr>
<td></td>
<td>0.04</td>
<td>0.04</td>
<td>0.05</td>
</tr>
<tr>
<td>Interdependence</td>
<td></td>
<td>0.05</td>
<td>0.11</td>
</tr>
<tr>
<td>Affect</td>
<td>0.08 +</td>
<td>0.07</td>
<td>0.07</td>
</tr>
<tr>
<td></td>
<td>0.05</td>
<td>0.05</td>
<td>0.05</td>
</tr>
<tr>
<td>BIDR</td>
<td>0.03 *</td>
<td>0.03 *</td>
<td>0.03 *</td>
</tr>
<tr>
<td></td>
<td>0.01</td>
<td>0.14</td>
<td>0.13</td>
</tr>
<tr>
<td>Adj. R²</td>
<td>0.06 ***</td>
<td>0.07 ***</td>
<td>0.07</td>
</tr>
</tbody>
</table>

*Note. Ess = essential model; Int = interdependence model; All = model with all predictors; B = unstandardised regression coefficient; SE B = standard error of B; β = standardised regression coefficient, +p < 0.1, *p < 0.05, **p < 0.01, ***p < 0.001.*
Hypothesis H2) Relationship between condition and oneness measures

The results of a MANOVA for the effect of condition (real eyes, drawn eyes, chat, and baseline) on essential and interdependence scores found a significant main effect, Pillai’s trace \((3, 264) = 0.05, F(6, 528) = 2.41, p = 0.03\). This suggests that the composite essential and interdependence scores constructed within the MANOVA analysis differed across conditions. The respective ANOVA results for the two dependent variables (essential and interdependence scores) found a significant main effect of condition on essential scores, \(F(3, 264) = 3.02, p = 0.03\), and on interdependence scores, \(F(3, 264) = 3.22, p = 0.02\). This suggests that both essential and interdependence scores differ across conditions.

A post-hoc Tukey test revealed that the average essential score for the real eyes condition (\(M = 4.83, SD = 1.05\)) was significantly higher than that for the baseline condition (\(M = 4.26, SD = 1.20\)), \(p = 0.03\). There were no significant differences in the post-hoc Tukey test scores between the other combinations of conditions. These results suggest that the real eyes condition produced significantly greater essential oneness than did the baseline condition, but not significantly greater essential oneness than that produced by the drawn eyes (\(M = 4.71, SD = 1.02\)) and chat conditions (\(M = 4.50, SD = 1.22\)).

The post-hoc tests for interdependence revealed that the average interdependence score for the real eyes condition (\(M = 4.57, SD = 0.96\)) was only borderline significantly higher than that for the baseline condition (\(M = 4.12, SD = 1.01\)), \(p = 0.08\), but not significantly different from the average interdependence scores in the drawn eyes condition (\(M = 4.68, SD = 1.01\)) and the chat condition (\(M = 4.50, SD = 1.06\)). However, the average interdependence score for the drawn eyes condition was significantly higher than baseline (\(p = 0.01\)). These results suggest that the drawn eyes control condition, and not the real eyes experimental condition, was the best prime for interdependence. Taken together, these results suggest that the real eyes task is an effective prime for essential oneness, but it is not clear whether it is an effective prime for interdependence oneness, with one of the control conditions proving more effective at priming this kind of oneness. H2 from Study 1b was therefore partially supported.

Although two of the three conditions for a mediation analysis were met, the results of an ANOVA conducted in the initial pilot study revealed that community aspirations showed no significant difference by condition. Therefore, a mediation analysis to test whether changes in ProTs act at least partly through changes in the novel oneness measures could not
be performed. That is, while the experimental conditions did have an effect on at least one of
the updated measures of oneness, they were already found not to have an effect on the
measure of ProTs.

Open ended responses

The coding of the open ended responses was re-used from the initial study. To
reiterate, they were coded to capture the extent to which people used language that
represented a sense of connecting with the other person. These were formed into a continuous
variable comprising four levels – not relational, relational, strongly relational, and
metarelational. This relational continuous variable constructed from the coded qualitative
data did not significantly correlate with essential or interdependence oneness scores,
suggesting it measured something different.

2.5.2.3 Infinite values

Hypothesis H1) Relationships between oneness measures and between oneness and ProTs

Consistent with the correlation results for the data set as a whole, both essential and
interdependence scores correlated with community aspirations (see Table 2.15). In addition,
each type of oneness predicted community aspirations when controlling for affect and BIDR
(see Table 2.16). Together these results support H1.

Table 2.15

Pearson correlations between measures of oneness and ProTs for the infinite values set of
conditions including baseline condition (n = 247)

<table>
<thead>
<tr>
<th></th>
<th>1. Ess</th>
<th>2. Int</th>
<th>3. CA</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Essential</td>
<td></td>
<td></td>
<td></td>
<td>4.65</td>
<td>1.14</td>
</tr>
<tr>
<td>2. Interdependence</td>
<td>0.64 ***</td>
<td></td>
<td></td>
<td>4.47</td>
<td>1.05</td>
</tr>
<tr>
<td>5. Community Aspirations</td>
<td>0.30 ***</td>
<td>0.30 ***</td>
<td></td>
<td>5.99</td>
<td>0.74</td>
</tr>
</tbody>
</table>

Note. M = mean; SD = standard deviation; correlation values are Pearson correlation coefficients, *p < 0.05, **p < 0.01, ***p < 0.001.
Table 2.16

Summary of multiple regression models for novel oneness variables predicting community aspirations for the infinite values set of conditions including baseline condition (n = 268)

<table>
<thead>
<tr>
<th></th>
<th>1 Ess</th>
<th></th>
<th>2 Int</th>
<th></th>
<th>3 All</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>SE B</td>
<td>β</td>
<td>SE B</td>
<td>β</td>
<td>SE B</td>
</tr>
<tr>
<td>(Intercept)</td>
<td>4.75</td>
<td>0.25</td>
<td>4.81</td>
<td>0.25</td>
<td>4.60</td>
<td>0.26</td>
</tr>
<tr>
<td>Ess</td>
<td>0.18</td>
<td>0.04</td>
<td>0.12</td>
<td>0.05</td>
<td>0.18</td>
<td></td>
</tr>
<tr>
<td>Interdependence</td>
<td></td>
<td>0.20</td>
<td>0.04</td>
<td>0.28</td>
<td>0.12</td>
<td>0.06</td>
</tr>
<tr>
<td>Affect</td>
<td>0.06</td>
<td>0.05</td>
<td>0.03</td>
<td>0.05</td>
<td>0.04</td>
<td>0.04</td>
</tr>
<tr>
<td>BIDR</td>
<td>0.04</td>
<td>0.02</td>
<td>0.04</td>
<td>0.02</td>
<td>0.04</td>
<td>0.02</td>
</tr>
<tr>
<td>Adj. R²</td>
<td>0.10</td>
<td></td>
<td>0.10</td>
<td></td>
<td>0.12</td>
<td></td>
</tr>
</tbody>
</table>

Note. Ess = essential model; Int = interdependence model; All = model with all predictors; B = unstandardised regression coefficient; SE B = standard error of B; β = standardised regression coefficient; + p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001.

Hypothesis H2) Relationship between condition and oneness measures

The results of a MANOVA for the effect of condition (infinite WC, finite WC, no WC and baseline) on essential and interdependence scores found a borderline significant main effect, Pillai’s trace (3, 243) = 0.05, F(6, 486) = 2.11, p = 0.05. The respective ANOVA results for the two dependent variables (essential and interdependence scores) found a significant main effect of condition on essential scores, F(3, 243) = 2.72, p = 0.045, and a borderline significant main effect of condition on interdependence scores, F(3, 243) = 2.61, p = 0.052.

Post-hoc Tukey’s tests revealed that the average essential score for the infinite WC condition (M = 4.77, SD = 1.14) was borderline significantly higher than that for the baseline condition (M = 4.26, SD = 1.20), p = 0.09. However, the average essential score for the no WC condition (M = 4.82, SD = 1.21), was also significantly higher than baseline, p = 0.04. Similarly, a post-hoc Tukey’s test for interdependence scores revealed that the average interdependence score for the infinite WC condition (M = 4.67, SD = 1.19) was significantly higher than that for the baseline condition (M = 4.12, SD = 1.01), p = 0.04. Taken together, these results suggest that the revelation of shared infinite values in the infinite WC condition is an effective prime for interdependence oneness, and possibly an effective prime for essential oneness. The results also suggest that being asked to generate three things of infinite
value without being shown a word cloud is an effective prime for essential oneness. However, although these primes were more effective than doing nothing at all, the data do not suggest that they are better than each other or than the finite WC condition.

These results somewhat support H2, in that the infinite WC condition produced significantly greater essential and interdependence scores compared to baseline. However, they depart from H2 in that they did not produce significantly greater scores compared to all of the respective control conditions. Because the analyses in the initial pilot study found that community aspirations showed no significant difference by condition, mediation analyses could not be performed.

Open ended responses

The coded open ended responses were re-used from the initial study. The results of separate logistic regressions that modelled binary similarity scores as functions of essential and interdependence, controlling for BIDR and affect, found no significant effect of either of the two types of oneness. This suggests that the coded open ended responses measured something different or possibly more general than what the essential and interdependence items measured.

2.5.3 Discussion

In light of the potential conceptual conflation within scales like the Connectedness to Nature and Metapersonal Self-Construal scales used in the initial pilot study, the scale items were re-arranged for a follow-up analysis (Study 1b) to form two new oneness variables that refer to different specific kinds of oneness connections based on the oneness typology (Chapter 3 of the current thesis). This achieved two goals: 1) a pilot use/initial exploration of some of the concepts in the typology; and 2) a potentially more valid test of the effectiveness of the eye gaze task and revelation of shared infinite values task as oneness primes.

The first hypothesis was that essential and interdependence scores would be significantly related to the general oneness variable, to each other, and to community aspirations. It was important to find a relationship between essential and interdependence scores, and between each of these scores and the general oneness variable. In theory, if essential and interdependence connections are two kinds of oneness connection, then they
both would be expected to correlate with each other and with items that refer to oneness/deep connection in general. After finding that these relationships were positive and significant for the data set as a whole, and therefore that the general theoretical framework was plausible, the more specific hypotheses were turned to.

Both essential and interdependence oneness scores were significantly correlated with community aspirations. Distinguishing between essential and interdependence types of oneness therefore produced results that are consistent with the trend of positive relationships between oneness and ProTs in the literature. It also suggests that different types of oneness connection in the oneness typology (Chapter 3 of the current thesis) are associated with ProTs. However, a causal relationship is yet to be established in future research.

The effects of condition on essential and interdependence scores were more promising than those in initial pilot study. In the eye gaze set of conditions, real eyes (the experimental condition) was the only condition associated with a greater average essential scores compared to baseline. This suggests that gazing into a stranger’s eyes for a minute produces a sense of essential oneness. However, real eyes did not produce greater average essential scores compared to the other two control conditions (drawn eyes and chat). Future research into the potential oneness effects of the eye gaze task would benefit from creating a context that is more conducive to finding the task a positive, connecting experience, which may not have been fostered in the undergraduate computer laboratory setting used in this research.

Regarding the effects of eye gaze on interdependence scores, the real eyes condition was associated with only a borderline significantly greater interdependence scores compared to baseline. Inconsistent with the hypotheses, drawn eyes, one of the control conditions, was associated with a significantly greater interdependence score compared to baseline. Pictures of eyes have previously been found to enhance prosocial behaviour (Bateson et al., 2013; Bateson et al., 2006; Haley & Fessler, 2005), purportedly because they prime biases to behave prosocially that are based on reciprocity and reputation. In other words, cues that we are being monitored, even if subtle or subconsciously perceived, prime an inherent bias to act prosocially because of the indirect benefits to the self that would result from others witnessing this kind of behaviour. This suggests that the presence of eyes primes an implicit sense of the importance of community responsibility. The importance of community
responsibility, with its indirect benefits to the self, are more consistent with an *interdependence* type of oneness than an *essential* type of oneness.

However, if eyes have this effect, it is curious that drawn eyes produced this sense of interdependence to a greater extent than did real eyes. One possible explanation would be that gazing into real eyes is more emotionally intense than is gazing into drawn eyes. If the real eye gaze task does produce stronger feelings of connection, then the feeling of connection might overpower the monitoring effect of eyes in general. According to this explanation, the drawn eyes would be free to prime a sense of the importance of reciprocity in an interdependent system without being overpowered by stronger feelings of connection.

Regarding the effects of the infinite values set of conditions on *essential* and *interdependence* scores, the summarised results are that the infinite WC condition produced significantly higher *interdependence* scores and borderline significantly higher *essential* scores compared to those in the baseline condition; and that the no WC condition produced significantly higher *essential* scores compared to the baseline condition. It was hypothesised that the revelation of shared infinite values would be an effective oneness prime because previous research found that it produced a sense of belonging to a common humanity, which was argued to represent a sense of shared essence. Finding only a borderline significant result in this direction lends partial support to this claim. However, there was a significant effect on *essential* scores for the no WC task, in which participants generated three things of infinite value and then completed the questionnaire without seeing any word cloud. This suggests that just thinking about things that are of infinite value to oneself primes a sense of *essential* oneness (provided that one is not shown the finite word cloud), and that the revelation that they are shared with most other people is not the important part.

It is puzzling why the infinite values task would prime *essential* oneness scores while not priming community aspirations. One possible explanation is that the importance of contributing to the betterment of society is already relatively salient for most people, meaning the infinite values task had less potential to create an effect. Conversely, the idea that humans share an essence with each other and life in general might be less salient and therefore more susceptible to a rise in salience. If this is true, then the paradigm employed by the research presented here, in which experimentally manipulated conditions are analysed with respect to their effect on ProTs via oneness as a mediator, must use measures of ProTs that are sufficiently susceptible to a rise in salience.
Although the infinite WC condition had only a borderline significant effect on essential scores, it did have a significant effect on interdependence scores compared to the baseline condition. The infinite WC task was hypothesised to prime essential oneness scores through a sense of shared humanity. However, it is conceivable that recognising shared infinite values also primes a sense of belonging to an interacting community or wider ecosystem. Indeed, that seems to be what this preliminary evidence suggests. The finding that the no WC condition had no effect on interdependence scores suggests that for this set of oneness primes, an interdependence oneness connection requires the knowledge that we share the things of infinite value, while introspection alone (no WC) with respect to infinite values seems to be enough for essential oneness.

### 2.6 General discussion

The research presented here aimed to expand on the well established correlation in the literature between various oneness measures and ProTs by providing evidence for a causal link. This overarching goal was divided into two general questions. The first related to the oneness effects of two novel, human-centred oneness primes, namely eye gaze with a stranger and the revelation of shared infinite values. The second question related to the mediating effect of four oneness measures on the relationship between experimental condition and a measure of ProTs (community aspirations). While the results replicated the trend in the literature by finding a correlation between all four oneness measures and community aspirations, the experimental conditions were not effective at increasing scores on oneness measures nor community aspirations. However, this does not necessarily undermine the plausibility of a causal relationship between oneness and ProTs, which has been alluded to elsewhere (e.g., Arnocky et al., 2007; Cialdini et al., 1997; A. C. Davis & Stroink, 2016; J. L. Davis et al., 2009; Dutcher et al., 2007; Garfield et al., 2014; Mashek et al., 2007; Mayer & Frantz, 2004; Schultz, 2001; Weinstein et al., 2009). The negative result might be due to ineffective primes or invalid measures of the kind of oneness of interest.

Previous research found that images of nature scenes increased connectedness to nature and intrinsic aspirations (of which community aspirations are a part) (Weinstein et al., 2009), and that connectedness to nature mediated the relationship between immersion in these nature scenes and intrinsic aspirations. Had the oneness primes worked, a similar relationship would have been expected. This suggests that oneness with nature as measured
by the Connectedness to Nature scale, and ProTs as measured by the community aspirations items of the Aspirations Index, are both able to be primed in an experimental setting, suggesting our primes simply fell short, as discussed in the study-specific discussions above.

Another possible explanation of the negative result, other than ineffective experimental conditions, was invalid oneness measures. To explore this possibility, the data were re-analysed in Study 1b after re-arranging the items from the four oneness measures used in the initial study into two types of oneness (essential and interdependence) proposed within the oneness typology (Chapter 3 of the current thesis). This was not intended as a test of the typology, but rather a pilot use of some of the concepts of the typology and an attempt to thoroughly explore the effects of the oneness primes used in this set of studies. Using these two new oneness measures, eye gaze and generating things of infinite value produced significantly greater essential scores compared to baseline, and the revelation of shared infinite values produced significantly greater interdependence scores compared to baseline. The results of the follow-up analysis were therefore more consistent with the hypotheses. However, it is necessary to emphasise the preliminary and therefore limited nature of the follow-up results. One limitation is that the decision to re-analyse the data with new variables was made after failing to confirm the hypotheses using the pre-existing measures in the initial study. This practise of post-hoc adjustments increases the chance of a type 1 error, so these results would need to be replicated in order to accept them with more confidence.

Another limitation is that the two new variables constructed in the follow-up analysis, essential and interdependence, were constructed from whatever items were available in the measures from initial study. This resulted in the final essential variable consisting of only three items, two of which were nearly the same in that they both referred to kinship with other life forms. A stronger design would be to include a range of items deliberately constructed to distinguish between essential and interdependence types of oneness. On this note, an initial step for future research would be to perform a factor analysis to test statistically whether the different kinds of oneness connection outlined in the typology in Chapter 3 do indeed form three factors, or whether they collapse into a more general oneness factor (as explored in Chapter 4 of the current thesis). The resulting scales could then be used to test hypotheses relating to causal relationships between oneness and ProTs (as explored in Chapter 5 of the current thesis).

Further, while the pre-constructed scales used in the initial study included items that referred to oneness with entities at a variety of different scopes (from humanity, to life, to
nature, to all of existence), the items that made it into the *interdependent* and *essential* variables in the follow-up analysis referred only to nature. This created a mismatch between the nature-centred measures of oneness and the human-centred oneness primes and measure of ProTs (community aspirations). Future research would benefit from aligning the scope of each component.

Two final limitations relate to the shortened Aspirations Index (using only the community aspirations items) and the experimental design in which participants were not randomly assigned at the individual level to their respective conditions. Regarding the former, the original Aspirations Index contains subscales for multiple types of aspirations so that their relative importance can be analysed. Including only the community aspirations subscale precluded the ability to do this and therefore permitted analyses of only the absolute differences in community aspirations. Regarding the latter, participants were randomly assigned to an experimental condition at the lab stream level, not the individual level. This approach is vulnerable to confounds through possible systematic variation at the lab level, which may arise from social norms associated with, for example, the time of the lab, the nature of interactions within a given lab (creating cultural differences), etc. However, systematic variation at the lab level was likely to be low, given that students are effectively randomly assigned to labs (i.e., whichever fits their timetable), and the data were collected in only the 5th laboratory session of the year (reducing the opportunity to create cultural differences between lab groups). A multilevel analysis could nonetheless be considered in future research for reassurance that there is no significant effect of any small variation at the lab group level.

Despite these limitations, the results of the follow-up analysis suggest that further exploration of the oneness typology is warranted. A suggested first step is a factor analysis study that tests the extent to which the distinctness of the different types of oneness it outlines are statistically supported. The resulting scales can then be used for further research into the relationship between oneness and ProTs.

### 2.7 Conclusion

How one conceives of their connection to other people, nature, or all of existence is related to their tendency to value and be motivated to protect entities other than their immediate self. Oneness refers to the phenomenon in which such a connection is profound
and salient, where a profound connection might include a sense of sharing an essence or of forming a larger, interdependent whole. However, the causal relationship between oneness and prosocial and pro-environmental tendencies (ProTs) remains relatively unsupported. This represents a compelling gap, because of the importance of ProTs in living well together and promoting the flourishing of the natural ecosystems in which we find ourselves. The research presented here aimed to fill this gap by testing the effects of two novel, human-centred oneness primes on a number of oneness measures and a measure of prosocial values. While the established measures of oneness provided a negative result, re-arranging their items into two new variables based on a novel oneness typology provided more positive results. In particular, there is preliminary evidence that eye gaze with a stranger and generating things of infinite value both prime a sense of *essential* oneness, and the revelation of shared infinite values primes a sense of *interdependence*. This creates optimism about the future development and testing of the ideas in the oneness typology, and ultimately to understanding how different kinds of oneness relate to ProTs or any other psychological phenomenon of interest.
Chapter 3

The Oneness Typology: Deconstructing Psychological Oneness Concepts and Categorising their Basic Features

Overview

The psychological literature contains multiple concepts and measures describing a sense of profound connection with others, whether another person, a group of people, or abstract entities like humanity and nature (here called “oneness” concepts). However, the many and varied oneness concepts and their associated measures use language that would seem to imply important variation in psychological oneness – variation that has yet to be systematically described and organised. In this chapter, a “oneness typology” is presented based on a review of the oneness concepts and measures in the psychological literature. The oneness typology has three dimensions – manifestation, psychological ontology, and scope. In particular, it distinguishes between oneness experiences, beliefs, and feelings (the manifestation dimension); expansion via including the other in the self, interdependence with the other, and sharing something essential with the other (together the psychological ontology dimension); and a scope dimension, which refers to the other entity in question (e.g., a partner, group, nature, etc.). The typology contributes to the conceptual clarity of oneness as a psychological construct; provides language and concepts that assist in navigating the relevant literature; and produces novel predictions. In addition, it is shown that existing measures tend to conflate multiple types of oneness, suggesting a gap in the literature with respect to possible differential effects of different types of oneness highlighted by the typology. Potential future research is outlined in relation to prosocial and pro-environmental tendencies.
3.1 Introduction

As humans, we find ourselves on a beautiful planet as an influential part of a natural community of sentient and non-sentient life forms. Sustainability, in its deepest sense, is about keeping this remarkable state of affairs going for as long as we can. However, in order to achieve this goal, we must overcome significant threats, including anthropogenic climate change, environmental degradation and massive wealth inequality. An important contribution of psychological research to “deep” sustainability is in developing a detailed understanding of the psychological precursors to prosocial and pro-environmental tendencies (ProTs). One potential precursor is the perception of “oneness” between the self and social and ecological systems. In essence, oneness entails the merging of self and other such that the individual feels profoundly connected to the world at large or some entity within it. The term “oneness” or variations on “being at one” has been used extensively within the extant literature (e.g., Cialdini et al., 1997; Dutcher et al., 2007; Garfield et al., 2014; Gómez et al., 2011; Hood, 1975; MacLean et al., 2012; Mayer & Frantz, 2004; Schultz, 2002; St John & MacDonald, 2007; Swann et al., 2012; Tam, 2013), with related terms including identity/identification (e.g., Leary et al., 2008), self-construal (e.g., DeCicco & Stroink, 2007), self-transcendence (e.g., Yaden et al., 2017), inclusion of other in the self (Aron et al., 1991), mysticism/spirituality (Hood, 1975), deep ecology (e.g., Drengson, 1995), and connectedness (e.g., Mayer & Frantz, 2004).

The sense of profound connection entailed by oneness may in turn promote the concern and care needed to act for the common good. At the interpersonal level, for example, a sense of oneness with another person has been associated with the motivation to help that person when in need (Cialdini et al., 1997; Maner et al., 2002). A sense of community oneness has similarly been shown to predict helping behaviour (Mashek et al., 2007). On a broader human scale, oneness with people in general has been associated with kindness, compassion, forgiveness and valuing social relationships (Leary et al., 2008).

There is also considerable evidence for the relationship between a sense of oneness with nature and pro-environmental values and motivations. For example, studies have shown nature oneness to be associated with valuing the welfare of the environment for its own sake (J. L. Davis et al., 2009; Leary et al., 2008; Mayer & Frantz, 2004; Schultz, 2001; Weinstein et al., 2009); environmental concern (Dutcher et al., 2007); pro-environmental attitudes (Garfield et al., 2014); even acting across domains to promote prosocial values (Weinstein et al., 2009). Oneness with nature has also been associated with pro-environmental behaviour (J.
L. Davis et al., 2009; Dutcher et al., 2007; Mayer & Frantz, 2004; Schultz, 2001; Weinstein et al., 2009), including vegetarianism, organic purchases, membership in an environmental organization, and commitment towards ecological issues (Nisbet et al., 2009).

Finally, concepts that refer to more general oneness than just oneness with people or nature have also been found to relate to ProTs (e.g., A. C. Davis & Stroink, 2016; DeCicco & Stroink, 2007; Garfield et al., 2014; Huber & MacDonald, 2012). It is fair to state that the general trend between oneness and ProTs is well established. However, the vast range of oneness concepts used in the relevant literature calls for some conceptual integration to assist in understanding and comparing the literature and guiding future research.

This chapter presents a typology of oneness and related concepts as discussed in the psychological literature, with a particular emphasis on how oneness has been measured in scale-based research. It is suggested that the typology provides a clearer sense than previously of exactly what psychology is talking about when it is talking about oneness, especially in regard to the scope of oneness, the psychological ontology of oneness and its manifestation (defined below). The typology is offered as a theoretical foundation to fine-tuning measures of oneness and further exploring its role in promoting prosocial and pro-environmental tendencies (ProTs). The conclusion includes thoughts as to new quantitative measures, how they might be developed and tested, and how they might be expected to relate to ProTs.

3.2 Oneness typology

In order to construct the typology the relevant psychological literature was reviewed using the following steps. After the author of the current thesis conducted a pilot study into the causal relationship between a number of pre-existing oneness measures and ProTs (Chapter 2 of the current thesis), he had already developed a sense for what some of the key oneness concepts were in the psychological literature. In particular, the pilot study focussed on inclusion of other in the self (Aron et al., 1991; Aron et al., 1992), inclusion of nature in the self (Schultz, 2002), connectedness to nature (Mayer & Frantz, 2004), and metapersonal self-construal (DeCicco & Stroink, 2007). These four concepts were used as the gateway to the psychological oneness literature. The literature these articles cited, and the literature that cited these articles, was scanned for other relevant concepts. Any article that presented a
psychological oneness concept was reviewed. Because the definition of what constituted a oneness concept was not thorough until after the typology was formed, the inclusion criteria for what constituted a relevant article were relatively general. In particular, an article was reviewed if it presented a psychological concept primarily concerned with describing people’s consciously accessible perceptions of being deeply connected to others, such that the “self” is at least partly constituted by that connection. To capture articles that did not cite or were not cited by the four gateway articles, a Google Scholar search with the keywords “oneness psychology” was also conducted, with the same inclusion criteria applied to the first 20 pages of results sorted by relevance. The process of reading the resulting collection of articles led to more exploration of cited articles that was not formally structured.

It is worth noting that the inclusion criteria for the review of oneness concepts was different from the inclusion criteria for the assessment of oneness measures outlined later in the chapter. This is because it was deemed beneficial to draw on as wide a range of relevant concepts as possible to inform the conceptual typology. The assessment of the measures, however, required more constraints, so that only measures that were indeed predominately oneness measures were being compared to each other and to the dimensions of the typology.

The typology has three dimensions (see Figure 3.1) that emerged from a combination of noticing patterns in the language and concepts used in the relevant literature, in addition to the author’s own thinking. Throughout the process of reading the literature, four key observations emerged relatively autonomously, to which other thoughts could be anchored, eventually forming the structure of the typology.
The first key observation was that the widely cited concept of inclusion of other in the self and its scale had been applied to the relationship between two people (Aron et al., 1992), between self and social groups (Mashek et al., 2007; Tropp & Wright, 2001), self and people in general (Leary et al., 2008), and self and nature (Schultz, 2002). Similarly, Friedman (1983) defined his self-expansiveness concept such that it can apply to everything from one other to all of existence. This suggested that at least some kinds of oneness can act across a range of scales (the **scope** dimension of the typology).

The second key observation that stood out was Perrin and Benassi’s (2009) argument that Mayer and Frantz’s (2004) Connectedness to Nature scale measures a cognitive connection to nature, and not the intended “emotional connection to nature”. This drew attention to the variation among oneness concepts with respect to their psychological domain in which the oneness information manifests. At first, the classic psychological tripartite model of affect, cognition and behaviour was considered as possibly appropriate for capturing this variation. However, attempting to resolve the aforementioned conflict between the Connectedness to Nature scale’s supposedly emotional manifestation and Perrin and

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**Figure 3.1.** The three dimensions of the oneness typology. Manifestation and psychological ontology each have three sub-dimensions. Scope is theoretically continuous, but the present thesis focusses on two broad scopes – nature and humanity.
Benassi’s (2009) assertion that it is in fact cognitive led to the conviction that Mayer and Frantz (2004) likely intended their concept to refer to an intuitive or felt sense of connection, rather than an emotion per se. The distinction was therefore made between two types of cognition, namely 1) outright beliefs and 2) intuitions/feelings/senses of oneness. The third type of manifestation, experience, was already relatively clearly and explicitly distinguished in the oneness literature. Beliefs, feelings and experiences became the three categories in the manifestation dimension of the typology.

The third key observation was the apparent contradiction between the notion of self-expansion/inclusion of other in the self and the frequent use of language that implied oneness was often about a sense of being a smaller part of something larger. Trying to resolve this apparent paradox eventually led to the third dimension of the typology, which was labelled psychological ontology. Ontology refers to the nature of being, so the ontology of a oneness concept refers to the nature of the connection between self and other. It is psychological because these concepts do not describe the nature of the oneness connection as it exists in reality, but rather perceptions of it (it is one thing to say study whether we are in fact all one, and it is another to study beliefs and feelings of oneness). Resolving the paradox required distinguishing between the perception that the self is connected to a larger entity (thereby having a sense of diminished self relative to the larger entity), and identification with the larger entity itself (thereby having an expanded self). This distinction is captured within the psychological ontology dimension.

The final key observation emerged from the contrast between Mayer and Frantz’s (2004) concept of connectedness to nature and Dutcher et al.’s (2007) concept of connectivity with nature. The two concepts have similar names, and both reference the same Aldo Leopold quote in which Leopold (1970, p. 203) states that “all ethics so far evolved rest upon a single premise: that the individual is a member of a community of interdependent parts”. However, while Mayer and Frantz used the quote as an example of what connectedness to nature is trying to capture, Dutcher et al. used the quote as a point of contrast to highlight what connectivity with nature is not trying to capture. That is, connectivity with nature is not trying to capture “knowledge of natural resource economics”, but rather an “intuitive sense of sameness” or shared essence (Dutcher et al., 2007, p. 479). This contrast between a fundamental shared essence and a more superficial interdependence combined with the third pillar to help to form the psychological ontology (PO) dimension, resulting in three types of PO – expansion, interdependence and essential.
To summarise, the general structure of the oneness typology emerged out of an informal analysis of the language used to describe a systematically compiled collection of oneness concepts in the psychological literature. The resulting typology has three dimensions. The first relates to the scope of the oneness (what entities it includes, such as one other person, a social group, nature, and so on). The second relates to the nature of the psychological ontology that constitutes the oneness (expansion, interdependence and essential). The third relates to the psychological manifestation of the oneness (belief, feeling and experience). Taken together, the typology suggests that people can believe, feel, or experience that they are connected to some “other” either through self-expansion to include the other, interdependence with the other, or sharing an essence with the other; where the other can range in scope to include a variety of different entities.

3.2.1 Scope

Oneness involves a perceived connection between the self and some “other”, but the concepts and measures used within the psychological literature vary with respect to the other in question. At the simplest level it may be one other, as is the focus of Aron et al.’s Inclusion of Other in the Self scale (Aron et al., 1991; Aron et al., 1992; Aron & Aron, 1997; Aron et al., 2004). Oneness may also be experienced at a group level, with notions such as collectivism (Oyserman, Coon, & Kemmelmeier, 2002), identity fusion (Swann et al., 2012), inclusion of ingroup in the self (Tropp & Wright, 2001), and overlap of self, ingroup, and outgroup (Schubert & Otten, 2002). Concepts that focus on nature include connectedness to nature (Mayer & Frantz, 2004), connectivity with nature (Dutcher et al., 2007), inclusion of nature in the self (Schultz, 2002), nature relatedness (Nisbet et al., 2009), interdependence with/commitment to the environment (J. L. Davis et al., 2009), ecological self (Bragg, 1996; Naess & Drengson, 2008), and the ecopsychological self (St John & MacDonald, 2007).

Oneness may go even broader to focus on “everything” via metapersonal self-construal (DeCicco & Stroink, 2007), mystical experiences (Hood, 1975; MacLean et al., 2012), the experiential/penomenological dimension of spirituality (MacDonald, 2000b), and the Universality factor of the Spiritual Transcendence scale (Piedmont, 1999). Finally allo-inclusive identity (Leary et al., 2008) describes oneness with a range of entities at various scales from both the social and the natural domains, including a close friend, your family, the earth, and the universe.
It is worth noting that although the word oneness is sometimes used in relation to intermediate scopes (e.g., with a person’s community), it is likely to be more intuitively understood as a phenomenon that extends to larger, abstract entities like humanity, nature, or all of existence. As a tool for describing and categorising extant oneness concepts, the more narrow scope is included. However, as a tool for generating future research, the wider scopes may be more applicable. Indeed, the subsequent chapters in this thesis report research related to oneness with the larger, more abstract entities of nature and humanity.

### 3.2.2 Psychological ontology

The psychological ontology (PO) of a sense of oneness, or what the perceiver perceives to be its fundamental nature, can be categorised in three broad ways: *expansion*, *interdependence*, or *essential*. That is, the self can be thought of as expanding to include the other, to be interdependent with the other, or to share an essence with the other.

#### 3.2.2.1 Expansion

An *expansion PO* is based on the idea that something other can be considered part of the self, thereby adding to or “expanding” the self. Perhaps the most well-known example of this is Aron et al.’s (1991) conceptualisation of close relationships as inclusion of other in the self (IOS). Aron et al. (1992) devised a single item, pictorial measure of IOS, which consists of seven pairs of progressively more overlapping circles, one circle representing the self and one representing other. IOS is explicitly based on a self-expansion that serves to increase one’s sense of efficacy by “perceiving oneself as having access to [the other’s] resources… [as though] the other’s resources are one’s own” (Aron et al., 2004, p. 105) see also ((Aron & Aron, 1997; Aron, Aron, & Norman, 2001; Wright, Aron, & Tropp, 2002). Aron and his colleagues also argued that this process generally brings with it, as an unconscious, cognitive by product “experiencing (consciously or unconsciously) the world to some extent from the other’s point of view” (Aron et al., 2004, p. 105), and including “primarily the characteristics, memories, and other features that locate the person in social and physical space… [such that] people may easily confuse their own traits or memories with those of a close other” (Aron et al., 2004, p. 106).
Cialdini et al. (1997) found that the IOS scale predicted helpful behaviour towards another for whom they were primed to feel empathic concern. Cialdini et al. also argued that full inclusion removes any distance between the self and the other, so that actions that care for the other are self-directed rather than other-directed.

Inclusion of ingroup in the self (IIS), like IOS, is framed in terms of self-expansion (Tropp & Wright, 2001; Wright et al., 2002), and is described as “the degree to which the ingroup is included in the self” (Tropp & Wright, 2001, p. 586). Similarly, in describing their concept of inclusion of community in the self (ICS), Mashek et al. (2007) state that the ICS is “an explicit derivative of the [IOS]”, and argue that “if the community is part of the self, then we should be more likely to help the community because doing so is also helping the self” (260). Further, Schultz (2002, p. 67) describes inclusion of nature in the self (INS) as referring to “the extent to which an individual includes nature within his/her cognitive representation of self”. Finally, Leary et al. (2008, p. 137) describe allo-inclusive identity as including in the self-concept “broader categories of people, animals, and inanimate objects”, the distinguishing feature being “the inclusion of other entities in one’s self-concept, instead of merely an identity that extends beyond the individual him-or herself” (Leary et al., 2008, p. 137-138).

Oneness with nature has also been described in terms of expansion using other theoretical foundations than Aron et al.’s (1991; 1992) IOS. For example, in describing their concept of connectedness to nature, Mayer and Frantz (2004, p. 504) cite Roszak (1995) as saying that “if the self is expanded to include the natural world, behaviour leading to destruction of this world will be experienced as self-destruction”. Similarly, Nisbet et al. (2009, pp. 717-718) describe their concept of nature relatedness as “the notion of a self-construal that includes the natural world… so that damage to the planet is seen as damage to the self”. Further, DeCicco and Stroink (2007, p. 84) describe metapersonal self-construal as involving seeing others as part of the self, and as being related to Friedman’s (1983) concept of self-expansiveness. Arnokey et al. (2007, p. 255) support this when they describe metapersonal self-construal as “consisting of [among other things] an inclusion of others in self (IOS)”. According to Pappas and Friedman (2007, p. 328), one assumption of Friedman’s (1983) self-expansiveness is that “there are no absolute limits as to what can or cannot be included as part of individuals’ self-concept. St John and MacDonald (2007, p. 50) also refer to Friedman’s self-expansiveness in explaining their concept of an ecopsychological self and its associated Nature Inclusive measure, noting that “this study also uses the idea of an
expanding self, but whereas Friedman was concerned primarily with self-expansiveness as expressed through identification with the entire universe, ecopsychologists focus primarily on the expansion of self to include our natural world”.

In summary, expansion is an incorporation of the other. It is assumed to facilitate prosocial and pro-environmental behaviour because once the other is part of the self, other-care becomes a type of self-care.

3.2.2.2 Interdependence

Aldo Leopold (1970, p. 203) captured the core of the interdependence PO when he wrote that “all ethics so far evolved rest upon a single premise: that the individual is a member of a community of interdependent parts”. The defining features of interdependence involve the perception of being a small part of a greater, symbiotic whole. A key implication of an interdependence PO is that benefits/harms to the other constitute only indirect benefits/harms to the self, not the direct benefits/harms assumed by an expansion PO.

Although Leopold (1970, pp. 203-204) was referring to an ethic that included “soils, waters, plants, animals, or collectively: the land”, an interdependence PO has been described in the psychological literature as underpinning oneness concepts with a variety of different scopes. For example, Agnew et al. (1998, p. 939) offered their concept of cognitive interdependence, in which they describe close relationships as involving the perception of ourselves “less as individuals and more as part of a pluralistic self-and-partner collective”. Similarly, but with a broader scope, Markus and Kitayama (1991) defined an interdependent self-construal as based on a faith in the “fundamental connectedness of human beings to each other” (227). Such an interdependent self-construal is one of the defining attributes of collectivism as posed by Triandis (1995).

In relation to nature, Mayer and Frantz (2004) used Aldo Leopold’s work to explain their concept of connectedness to nature, quoting him as stating that people can “experientially view themselves as egalitarian members of a broader natural community… and view their welfare as related to the welfare of the natural world”. Similarly, Nisbet et al. (2009, p. 718) described their concept of nature relatedness as encompassing “one’s appreciation for and understanding of our interconnectedness with all other living things on earth” and the subsequent “understanding of the importance of all aspects of nature”.

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Furthermore, in describing their model of interdependence with and commitment to the environment, Davis, Green, and Reed (2009, p. 174) noted that, “human beings are dependent both physically and emotionally on the natural environment; in turn, the fates of species and ecosystems are dependent on the actions of human beings”.

Various concepts and measures that draw on notions of connection to “everything” (often spiritually grounded), also use the language of interdependence. These refer to “belief systems [in which] each person, animal, and feature of nature is … inherently defined by his or her relationship to everything and everyone else” (Leary et al. (2008, p. 138), “a belief that one is part of a larger human orchestra” Piedmont (1999, pp. 988-989), and have used scale items such as “the entire cosmos is linked together by complicated and intricate physical laws” (Garfield et al., 2014, p. 360).

3.2.2.3 Essential

In response to Aldo Leopold’s emphasis on material interdependence mentioned at the start of the previous section, Dutcher and his colleagues (2007) wrote, that “although material interdependence is important, we believe that connectivity with nature arises not so much from knowledge of natural resource economics as from an intuitive sense of sameness with the world around (and within) us” (479). This captures an essential perspective, that “people and nature are of the same type [emphasis added]” (489). The ecological self also has elements of an essential connection with nature, in that holders are “in, and of, nature” (Naess & Drengson, 2008, p. 82).

A “shared essence” has also been posited at the group level by Swann et al. (2012, p. 448) who argued for this as a mechanism that facilitates the extension of their concept of identity fusion to groups far larger (e.g., whole nations) than the tribal units more common throughout our evolutionary history. Most notably, however, a common essence is posited at the level of “everything”. For example Piedmont (1999, p. 988) described their concept of spiritual transcendence as consisting of a perspective in which “a person sees a fundamental unity underlying the diverse strivings of nature and finds a bonding with others that cannot be severed, not even by death”, and Garfield et al. (2014, p. 357) described their concept of spiritual oneness beliefs as “a belief in the spiritual interconnectedness and essential oneness of all phenomena”. Metapersonal self-construal also refers to an essential connection, as
DeCicco and Stroink (2007, p. 84) described it as a self-representation that refers to “an essence beyond the individual and others to a universal focus”.

The essential perspective also features particularly strongly in experiences of oneness which have been described as a loss of “individual self” into a “unified whole” (Cloninger et al., 1993, p. 981); and a “loss of self [, which] is commonly experienced as an absorption into something greater than the mere empirical ego” (Hood, 1975, p. 31). Similarly Cloninger et al. (1993, p. 981) defined self-transcendence as referring “generally to identification with everything conceived as essential [emphasis added] and consequential parts of a unified whole”.

An essentialist dimension also appears in concepts and measures that focus predominantly on interdependence. For example Mayer and Frantz’s (2004) measurement of connectedness to nature, which has many references to interdependence, includes that item that “I feel that all inhabitants of earth, human, and nonhuman, share a common ‘life force’” (Mayer & Frantz, 2004, p. 513), with the notion of “life force” implying, at least to the author, an essence rather than an interaction. Similarly, in relation to interdependent self-construal, Markus and Kitayama (1991, p. 227) noted that the concept is “linked with a monistic philosophical tradition in which the person is thought to be of the same substance as the rest of nature”.

3.2.2.4 Summary and conceptual issues

To help distinguish between the three psychological ontologies (POs), Figure 3.2 displays them pictorially. A) represents an expansion PO as one circle (self) enveloping another and thereby expanding the self; b) represents an interdependence PO as two circles (self and other) joined by a two way arrow; and c) represents an essential PO as the two waves are joined at a base, representing a shared essence from which they have arisen. In self-transcendent or mystical experiences it may be as if one is existing in the base itself.
While in the preceding review examples have been used in which the three perspectives are kept fairly distinct, in reality, they often appear to be used interchangeably in definitions and scales designed to capture oneness. Just three examples of this are given here.

In one example metapersonal self-construal is described as capturing people with a self-expansive view (DeCicco & Stroink, 2007, p. 83-84), and as having a component of including the other in the self (Arnocky et al., 2007, p. 255), such that, for example, “world poverty is seen as one’s own poverty” (DeCicco & Stroink, 2007, p. 84). However, it is also described as a self-representation that refers to “an essence beyond the individual and others to a universal focus (e.g., I am connected to all of humankind, I am part of a natural order)” (DeCicco & Stroink, 2007, p. 84), implying an essential PO. Items drawing on these two dimensions are used within the corresponding scale.

Another example can be found in Schultz’s (2002) paper on his model of inclusion with nature. He writes that “we are all a part of nature. We are born in nature; our bodies are formed of nature [emphasis added]; we live by the rules of nature… our survival depends on an ecological balance with nature [emphasis added]” (p. 61), drawing on both essential (first italics) and interdependent perspectives (second italics). Later he also incorporates the notion of expansion by writing that “connectedness refers to the extent to which an individual includes nature within his/her cognitive representation of self” (p. 67), and by measuring this

*Figure 3.2. Pictorial representation of the three psychological ontologies, a. = expansion, b. = interdependence, c. = essential.*
“connectedness” aspect of his model using the Inclusion of Nature in the Self scale, which is a modified version of Aron et al.’s (1992) Inclusion of Other in the Self scale.

As a third example, even Aron et al.’s (1991, p. 241) concept of inclusion of the other in the self, which is based explicitly on a self-expansion model, reveals some conceptual murkiness when they write that “members of a close relationship each have a pattern of perceived interdependence [emphasis added] of outcomes in which partner’s and joint benefits are expected in the long run to benefit the self”, implying that inclusion of other in the self is at least partly trying to capture an interdependence PO. It might be that perceived interdependence eventually leads to perceived expansion, in which case they may be distinct but related phenomena. Alternatively, one might see expansion as simply a useful way to conceptualise and measure people’s perceived interdependence, rather than a psychologically meaningful phenomenon in its own right. In any case, the distinction is not clear.

In relation to expansion in particular, the conceptual murkiness may arise from the difficulty of people intellectually grasping the notion of an expanding, all-inclusive self. In the case of close relationships, which was the parent of the “inclusion of other in self” family of measures (Aron et al., 1991; Aron & Aron, 1997) it may be psychologically feasible. After all, one other person’s characteristics and resources, can, in a practical sense, be drawn on by a close partner. However, it is not clear how this applies to, say, inclusion of nature in the self. It is even less clear what it means to include everything in the self, as conceived in Friedman’s (1983) model of self-expansiveness. Nature and everything are never available to us in the same way as a close partner may be.

Schubert and Otten (2002) made a similar point in relation to inclusion of ingroup in the self, claiming that people rather tend to think of the connection around the other way, as of inclusion of self in the group. They proposed an altered Inclusion of Other in the Self scale in which the smaller “self” circle becomes progressively more included within the larger “group” circle.

So, although the oneness typology allows for an expansion PO and a wide scope, as this is consistent with the literature, it may be that when humanity, nature and everything are the focal point, interdependence or essential POs are likely to be more prevalent. The exception to this may be at the experiential level, discussed in the next section, when the individual self may be simultaneously and paradoxically perceived as both endlessly expanded and profoundly contracted so that it is indistinguishable from the context in view.
3.2.3 Manifestation

The current section elaborates on the different ways in which oneness may be perceived, as a belief, feeling, or experience. Beliefs refer to a proposition about the nature of reality; feelings refer to a sense that is not necessarily bound to one’s intellectual position on the nature of reality; and experiences are occasions on which one feels oneness.

Models of oneness-related concepts have previously been described as having multiple manifestations. For example, Schultz’s (2002) inclusion with nature is a tripartite model with the following three manifestations: a cognitive one being inclusion of nature in the self; an affective one being a sense of caring for nature; and a behavioural one being a commitment to protect nature. Similarly, Bragg (1996, p. 95) noted that the identification with others that is characteristic of an ecological self involves reacting cognitively, behaviourally, emotionally and experientially to another’s interests as though they are our own. Finally, Nisbet et al.’s (2009) concept of Nature Relatedness is conceptualised as comprising cognitions, affect, and behaviour (e.g., Breckler, 1984; Lindzey, Gilbert, & Fiske, 1998).

It was decided to exclude a behaviour dimension here, following Yaden et al.’s (2017) review of self-transcendent constructs, which states oneness “should not be confused with [its] antecedents or outcomes” (p. 3). That is, oneness behaviours are generally either antecedents (e.g., meditation or immersion in nature) or outcomes (e.g., prosocial or pro-environmental behaviour), and are neither necessary nor sufficient for believing in, feeling, or experiencing connections between the self and the world. Excluding behaviour also allow for a typology with more universal applicability as it removes the highly contextual element associated with behaviour. For example, the author’s location in a rather secular society (New Zealand), referring to spiritual practices within a oneness concept may not have good face validity.

3.2.3.1 Beliefs

Beliefs are operationalized here as the conscious endorsement of propositions about the nature of reality, in this case the nature of particular kinds of connection between self and some other. Some oneness concepts explicitly refer to beliefs. For example, the Universality subscale of Piedmont’s (1999) Spiritual Transcendence measure is defined as “a belief [emphasis added] in the unitive nature of life” (p. 989). Similarly, Olivos and Aragonés
(2011, p. 66) describe environmental identity partly as “the belief that [one] can be identified as an integral part of some kind of transcendental entity”. Finally, Garfield et al.’s (2014, p. 357) Oneness Beliefs scale was developed in order to address their observation that many measures of spirituality focus on experiences rather than beliefs.

Concepts that do not use the word “belief” can still refer to this manifestation of oneness. For example, many are based on the idea of a self-concept or self-construal (Aron et al., 1992; DeCicco & Stroink, 2007; Friedman, 1983; Leary et al., 2008), which are concepts that are at least partly based on propositional knowledge about what constitutes self. These can be identified by the self-report measures of these concepts. Items that use phrases like “I think/view/am aware of/etc.” point to the belief manifestation, as do items that are presented as propositions about the nature of the connection between self and other (for example “my personal welfare is independent of the natural world” (Mayer & Frantz, 2004, p. 513)).

3.2.3.2 Feelings

The feeling manifestation of oneness captures “feelings”, “senses” and “intuitions” of oneness. They are distinguished from beliefs as they do not need to align with a claim about the nature of reality. Swann et al. (2012, p. 1) described their concept of identity fusion as entailing “a visceral feeling [emphasis added] of oneness with the group”. Similarly, Dutcher et al. (2007) argued that connectivity with nature is a “sense [emphasis added] of shared or common essence between the self, nature, and others” (474), which arises not so much from knowledge of natural resource economics as from an intuitive sense [emphasis added] of sameness with the world around (and within) us” (479). Finally, Mayer and Frantz (Mayer & Frantz, 2004, p. 504) described the Connectedness to Nature scale as being designed to measure “an individual’s affective, experiential connection to nature” or an “experiential sense of oneness with the natural world”. Although they use the word “experiential”, they also describe it as an “affective sense” (Mayer & Frantz, 2004, p. 504), and the items in the Connectedness to Nature scale that refer to “feelings” of oneness ask about tendencies to feel a particular way, rather than about one-off experiences (Mayer & Frantz, 2004, p. 513).

Items in self-report measures that refer to a feeling manifestation of oneness use words like “feel” and “sense”. Although this distinction between felt and believed oneness may seem trivial or esoteric, Cloninger et al. (1993, p. 982) note, in their discussion on self-
transcendent experiences, that the “use of language to describe self-transcendent experience is difficult at best because self-transcendence cognition is intuitive rather than analytical and deductive”. This refers to an experience manifestation, but the same applies to the feeling manifestation. Oneness measures that refer to “feelings” and “senses” of oneness, therefore, may encourage respondents to respond more intuitively, rather than feeling a need to provide an accurate account of their understanding of reality. I might be reluctant to say I believe I am one with everything, but I might be open to saying that I’ve felt that way before, and these feelings may have important psychological consequences.

3.2.3.3 Experiences

Oneness experiences have an intuitive/felt dimension, but unlike feelings per se they are state-like rather than trait-like. They may well also be much stronger. For example, Yaden et al. (2017, p. 2) define self-transcendent experiences as “transient mental states of decreased self-salience and/or increased feelings of connectedness”. Other oneness concepts centred on an experience manifestation are spiritual experiences (MacDonald, 2000a; MacDonald, 2000b) and mystical experiences (Hood, 1975; MacLean et al., 2012). These can be overwhelming, for example the following item from Macdonald’s (2000a) Expressions of Spirituality inventory “I have had an experience during which my sense of separate identity seemed to dissolve into something greater than itself”, and the item from the Mystical Experience questionnaire referring to having an experience of “unity with ultimate reality” (MacLean et al., 2012).

3.2.3.4 Summary and conceptual issues

The three manifestations are not necessarily mutually exclusive, and may be related in multiple ways. Experiences may influence longer lasting feelings and beliefs. Further, beliefs and thoughts related to oneness may predispose one to having oneness experiences. It is also important to note that while the typology includes only subjectively accessible manifestations, there are arguments that oneness may be experienced unconsciously (e.g., Schultz & Tabanico, 2007, p. 1220). That is people may sense oneness in ways that cannot be captured through language, or even through pictorial measures such as the Inclusion of Self in Other series. The Implicit Associations Test, a reaction time paradigm, has been used to measure oneness with nature (Schultz et al., 2004; Schultz & Tabanico, 2007). However,
having a high level of implicit association between self and other could in theory be underpinned by including the other concept in the self concept, including the self concept in the other concept, or including self and other in some transcendent concept. Implicit association tests therefore cannot distinguish between variation that is argued here to be potentially important. Further, the typology is based on variation in existing concepts and measures, under the assumption that the many and varied concepts and measures have already begun to structure existing variation in oneness perceptions. The language used in the measures therefore was a primary source of “data” for the construction of the typology – data that is only offered by self-report scales and not by implicit association tests. Implicit association tests could complement the oneness typology as a dependent variable that would be hypothesised to be positively predicted by the three different types of psychological ontology in the oneness typology.

3.3 Existing measures of oneness

Having outlined the typology, in this section it is used to assess the existing oneness measures in the psychological literature. This step is important, because understanding the relationship between oneness and prosocial and pro-environmental tendencies (ProTs) requires understanding exactly how oneness has been measured in the various studies. Conceptual descriptions, as has been argued in the review to this point, are often broad. Furthermore there is rarely perfect alignment between these and empirical measures which must often use more straightforward or metaphorical language.

Table 3.4 situates a range of oneness measures within the dimensions of the typology. To be included, a measure was required to be a self-report scale or subscale. This ensured that the content of the measure could easily be analysed. At least half of the scale’s or subscale’s items had to refer explicitly to at least one of the kinds of psychological ontology (PO) in the typology (expansion, interdependence, and/or essential), and at least one of the manifestations (belief, feeling and/or experience), the coding criteria for which are presented in Table 3.3 below. Potential antecedents or outcomes of oneness, such as behaviours, while often part of such scales were not counted as oneness items. All the scales discovered by the literature search method outlined earlier were examined for possible inclusion. There were a total of 20 scales that met the criteria.
Table 3.3
Coding scheme for assigning items in existing measures to the sub-dimensions of the psychological ontology and manifestation dimensions of the oneness typology

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Sub-dimension</th>
<th>Criteria for categorising scale item</th>
</tr>
</thead>
<tbody>
<tr>
<td>Psychological</td>
<td>Expansion</td>
<td>Represents the other as self</td>
</tr>
<tr>
<td>ontology</td>
<td>Interdependence</td>
<td>Represents relationship with other as important to the self, or refers to an interactional relationship between self and other, such that self and other form a greater whole of which the self is a smaller part</td>
</tr>
<tr>
<td></td>
<td>Essential</td>
<td>Represents self and other as sharing some kind of fundamental property, substance, or essence</td>
</tr>
<tr>
<td>Manifestation</td>
<td>Belief</td>
<td>Item presented as a proposition about the nature of the connection between self and other, or used words such as believe, think, view etc.</td>
</tr>
<tr>
<td></td>
<td>Feeling</td>
<td>Refers to tendencies to have particular “feelings” or “senses”</td>
</tr>
<tr>
<td></td>
<td>Experience</td>
<td>Refers to a specific instance that involved a “feeling”, “sense”, or “experience”</td>
</tr>
</tbody>
</table>
Table 3.4 (continued over next four pages)

**Self-report measures of oneness coded according to the psychological ontologies, manifestations, and scopes referred to among their items**

<table>
<thead>
<tr>
<th>Author</th>
<th>Measure</th>
<th>Brief description</th>
<th>Psychological Ontology</th>
<th>Manifestation</th>
<th>Experience</th>
<th>Scope</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Aron et al., 1992)</td>
<td>Inclusion of Other in the Self scale</td>
<td>Overlapping circles is an abstract representation. A respondent could therefore interpret it to capture any of the three kinds of oneness connection. Indeed, Aron et al. (1992) note that it may “capture something in the respondent’s perception of a relationship that is consistent with many theoretical orientations”</td>
<td>Expansion, Interdependent, Essential</td>
<td>Belief</td>
<td>Feeling</td>
<td>Experience</td>
<td>One other person</td>
</tr>
<tr>
<td>(Tropp &amp; Wright, 2001)</td>
<td>Inclusion of Ingroup in the Self scale</td>
<td>Measures cognitive representation of self and other as overlapping circles, but the abstract nature of it might tap into an intuitive sense of oneness without necessarily using words like “feeling” and “sense”</td>
<td>Belief</td>
<td>Feeling</td>
<td>Experience</td>
<td>One other group</td>
<td>Respondent instructed to select the pair that they feel best represents their level of identification with the group.</td>
</tr>
<tr>
<td>(Mashek et al., 2007)</td>
<td>Inclusion of Community in the Self scale</td>
<td>Respondent instructed to select the pair that best describes their relationship with the community at large.</td>
<td>Belief</td>
<td>Feeling</td>
<td>Experience</td>
<td>Community in question</td>
<td>Respondent instructed to select the pair that best describes their relationship with the group.</td>
</tr>
<tr>
<td>(Schultz, 2002)</td>
<td>Inclusion of Nature in the Self scale</td>
<td>Respondent instructed to select the pair that best expresses their relationship and degree of interconnectedness with nature</td>
<td>Belief</td>
<td>Feeling</td>
<td>Experience</td>
<td>Depends on respondent’s conceptualisation of “nature”</td>
<td>Respondent instructed to select the pair that best describes their relationship and degree of interconnectedness with nature.</td>
</tr>
<tr>
<td>(Leary et al., 2008)</td>
<td>Allo-Inclusive Identity scale</td>
<td>Respondent instructed to select the pair that best expresses their relationship/relatedness and connection/connectedness with 16 different others</td>
<td>Belief</td>
<td>Feeling</td>
<td>Experience</td>
<td>Specific other, people from a range of social groups, other animals, other natural entities, the whole universe</td>
<td>Respondent instructed to select the pair that best expresses their relationship/relatedness and connection/connectedness with 16 different others.</td>
</tr>
<tr>
<td>(Cross et al., 2000)</td>
<td>Relational-Interdependent Self-Construal scale</td>
<td>“When I feel very close to someone, it often feels to me like that person is an important part of who I am”</td>
<td>Belief</td>
<td>Feeling</td>
<td>Experience</td>
<td>Close relationships with other people in general</td>
<td>Respondent instructed to select the pair that best expresses their relationship/relatedness and connection/connectedness with 16 different others.</td>
</tr>
</tbody>
</table>

<p>| (Cross et al., 2000) | Relational-Interdependent Self-Construal scale | 11 verbal items | | | | | |</p>
<table>
<thead>
<tr>
<th>Author</th>
<th>Measure</th>
<th>Brief description</th>
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<th>Manifestation</th>
<th>Scope</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>[Gómez et al., 2011; Swann et al., 2009; Swann et al., 2012]</td>
<td>Identity Fusion scale</td>
<td>7 verbal items, one pictorial – overlapping circles with a small “self” circle becoming included within a larger “group” circle</td>
<td>“My country is me”</td>
<td>“I am strong because of my country” and “I make my country strong”</td>
<td>“I am one with my country”</td>
<td>“I am one with my country”</td>
</tr>
<tr>
<td>(Mayer &amp; Frantz, 2004)</td>
<td>Connectedness to Nature scale</td>
<td>14 verbal items</td>
<td>“I often feel a sense of oneness with the natural world around me”</td>
<td>“I imagine myself to be a part of a larger cyclical process of living”</td>
<td>“My personal welfare is independent of the natural world”</td>
<td>“I often feel disconnected from nature”</td>
</tr>
<tr>
<td>(Dutcher et al., 2007)</td>
<td>Connectivity with Nature scale</td>
<td>4 verbal items and one pictorial item (INS),</td>
<td>“I feel a sense of oneness with nature”</td>
<td>“I see myself as part of a larger whole in which everything is connected by a common essence”</td>
<td>“The world is not merely around us but within us”</td>
<td>“I feel a sense of oneness with nature”</td>
</tr>
<tr>
<td>(Nisbet et al., 2009)</td>
<td>NR-Self subscale of the Relatedness to Nature scale</td>
<td>9 items intended to measure an “internalized identification with nature”</td>
<td>NA</td>
<td>“I always think about how my actions affect the environment”</td>
<td>“My connection to nature and the environment is a part of my spirituality”</td>
<td>“I am not separate from nature, but a part of nature”</td>
</tr>
</tbody>
</table>
Table 3.4 cont.

<table>
<thead>
<tr>
<th>Author</th>
<th>Measure</th>
<th>Brief description</th>
<th>Psychological Ontology</th>
<th>Manifestation</th>
<th>Scope</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Clayton &amp; Opotow, 2003; Olivos &amp; Aragonés, 2011)</td>
<td>The core “Environmental Identity” Factor of the Environmental Identity scale</td>
<td>5 verbal items</td>
<td>“Being part of an ecosystem is an important part of who I am”</td>
<td>“I think of myself as a part of nature, not separate from it”</td>
<td>NA</td>
<td>Depends on respondent’s conceptualisation of nature</td>
</tr>
<tr>
<td>(J. L. Davis et al., 2009)</td>
<td>Interdependence with/Commitment to the Environment</td>
<td>11 verbal items</td>
<td>“It seems to me that humans and the environment are interdependent”</td>
<td>“I believe that the well-being of the natural environment can affect my own well-being”</td>
<td>NA</td>
<td>Depends on respondent’s conceptualisation of the environment</td>
</tr>
<tr>
<td>(St John &amp; MacDonald, 2007)</td>
<td>Nature Inclusiveness factor of the Nature Inclusiveness Measure</td>
<td>6 verbal items</td>
<td>“I have had the experience of feeling ‘at one’ with nature”</td>
<td>Respondents rate the degree to which they agree that the statements are true of themselves</td>
<td>NA</td>
<td>Oceans, rivers, mountains, forests, earth, and depends on respondent’s conceptualisation of nature</td>
</tr>
<tr>
<td>(DeCicco &amp; Stroink, 2007)</td>
<td>Metapersonal Self-Constructual scale</td>
<td>10 verbal items.</td>
<td>“I am aware of a connection between myself and all living things”</td>
<td>“I feel a sense of kinship with all living things”</td>
<td>Na</td>
<td>From all living things to the universe and everything</td>
</tr>
<tr>
<td>Author</td>
<td>Measure</td>
<td>Brief description</td>
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<td>Manifestation</td>
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</tr>
<tr>
<td>(Friedman, 1983; Pappas &amp; Friedman, 2007)</td>
<td>The Transpersonal Scale of the Self-Expansiveness Level Form</td>
<td>5 verbal items that represent potential responses to the question “Who am I?”</td>
<td>Expansion</td>
<td>Interdependent</td>
<td>Essential</td>
<td>Belief</td>
</tr>
<tr>
<td></td>
<td></td>
<td>“[I am] the entire universe beyond time which is me in an ultimate sense”</td>
<td>NA</td>
<td>NA</td>
<td>The instructions are to rate the your willingness to use a given concept as an answer to the question who am I. The instructions also state “there are no right or wrong answers and you are requested to answer on the basis of your own experiences and beliefs, not just on the basis of logic.”</td>
<td>NA</td>
</tr>
<tr>
<td>(Garfield et al., 2014)</td>
<td>Oneness Beliefs Scale</td>
<td>11 verbal items, 8 of which form a Spiritual Oneness subscale, 3 of which form a Physical Oneness subscale</td>
<td>NA</td>
<td>“The entire cosmos is linked together by complicated and intricate physical laws”</td>
<td>“A vital thread of life joins all objects and beings in the universe”</td>
<td>All items are presented as beliefs</td>
</tr>
<tr>
<td>(Piedmont, 1999)</td>
<td>Universality subscale of the Spiritual Transcendence Scale</td>
<td>9 verbal items</td>
<td>NA</td>
<td>“All life is interconnected”</td>
<td>“There is a higher plane of consciousness or spirituality that binds all people”</td>
<td>“I believe that on some level my life is intimately tied to all of humankind”</td>
</tr>
<tr>
<td>(MacLean et al., 2012)</td>
<td>External and Internal Unity Subscales of the Mystical Experience Questionnaire</td>
<td>9 verbal items intended to measure experiences associated with hallucinogenic drugs</td>
<td>“Experience the insight that ‘all is one’”</td>
<td>“Awareness of the life or living presence in all things”</td>
<td>NA</td>
<td>NA</td>
</tr>
</tbody>
</table>
Table 3.4 cont.

<table>
<thead>
<tr>
<th>Author</th>
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<th>Psychological Ontology</th>
<th>Manifestation</th>
<th>Scope</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Hood, 1975)</td>
<td>Ego Quality and Unifying Quality subscales of the Mysticism Scale/Measure of Reported Mystical Experience</td>
<td>8 verbal items</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>All items refer to transient experiences</td>
</tr>
<tr>
<td></td>
<td></td>
<td>“I have had an experience in which I felt everything in the world to be part of the same whole”</td>
<td>“I have had an experience in which something greater than myself seemed to absorb me”</td>
<td>NA</td>
<td>NA</td>
<td>Everything</td>
</tr>
<tr>
<td>(MacDonald, 2000a; MacDonald, 2000b)</td>
<td>Phenomenological Dimension of the Expressions of Spirituality Inventory</td>
<td>19 verbal items.</td>
<td>“I have had an experience in which I seemed to go beyond my normal everyday sense of self”</td>
<td>“I have had an experience in which my sense of separate identity seemed to dissolve into something greater than itself”</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td></td>
<td></td>
<td>“I have had an experience in which all things seemed to be parts of a larger whole”</td>
<td>“I have had an experience in which my sense of separate identity seemed to dissolve into something greater than itself”</td>
<td>NA</td>
<td>NA</td>
<td>“The world”, “all things”/“everything”, “all of reality”</td>
</tr>
</tbody>
</table>

Note. Example items in bold indicate that the item isolates the respective sub-dimension. Example items in plain text indicate that the item could be interpreted to represent the respective sub-dimension, but does not do so exclusively. Grid lines have been left in for clarity. The measures appear in no particularly meaningful order, other than to group the Inclusion of Other in the Self family of measures together, and then to group roughly by scope in ascending order from social groups, to nature, to all of existence.
One of the clearest trends depicted in Table 3.4 is that while the scope of each scale is usually fairly clear, all scales include some combination of at least two types of psychological ontology, and many include at least two kinds of manifestation. This means they measure a generic version of oneness within the scope of interest, and miss possible variations in how it is experienced. Furthermore these variations may have important implications for prosocial and pro-environmental tendencies as will be discussed next.

3.4 Relationship to prosocial and pro-environmental tendencies

As discussed, each of the three psychological ontologies (PO) is based on a different sense of reality. Using the nature scope as an example, if nature is included in the self via an expansion PO, then, theoretically, nature’s welfare is valued to the extent oneself is valued. Given that people intrinsically value themselves (i.e., simply for their own sake), this connection should be associated with strong pro-environmental tendencies, or prosocial tendencies if the scope is humanity. An essential PO is also likely to be associated with strong prosocial or pro-environmental tendencies, given that it implies a common bond and thus that the other is intrinsically valuable. Notably, an essential PO is also outward focused, and may be more plausible as an everyday view than an expansion PO which may be mostly confined to self-transcendent or mystical experiences.

This hypothesised relationship between an essential PO and intrinsically valuing the other is already conceptualised in the literature. For example, Dutcher et al. (2007) argued that a sense of shared essence with nature is most conducive to creating a sense of empathy and compassion towards nature, and ultimately increasing the salience of environmental values. Empathy and compassion are hypothesised to create what Daniel Batson (2011) calls altruistic motivations, which have as their ultimate goal increasing the other’s welfare. Similarly, a “deep ecology” perspective, which is defined by a recognition of the intrinsic value of other life forms, is argued to be based on an “ecological self”, in which the self is seen to be “in, and of, nature” (an essential PO). Finally, Thompson & Barton (1994, p. 150) argued that ecocentric individuals intrinsically value nature, and that this is based on a connectedness between humans and other aspects of nature … that transcends the ability of natural resources to satisfy human material or physical wants [emphasis added]”, implying
that something beyond just an interdependent connection with nature underpins valuing nature for its own sake.

On the other hand, if the self is seen as an interdependent part of nature, there is a potential loosening of the bond. Instead of nature being intrinsically valuable as it is me, or fundamentally like me, it may now be instrumentally valuable as it is useful because of how I need it. This view is consistent with popular concepts such as “ecosystem services” which many have argued denigrates nature (Crompton et al., 2014; Crompton, 2015; Monbiot, 2014; Monbiot, 2018).

Taken together then, the three POs would be expected to produce three different motivational strands in relation to nature or the other. An expansion PO would produce an inwardly-oriented intrinsic goal to protect nature; an interdependence PO would produce an outwardly-oriented instrumental goal to protect nature; and an essential PO would produce an outwardly oriented intrinsic goal to protect nature. These are quite different phenomena, and may have quite different consequences for some prosocial and pro-environmental tendencies.

It is worth noting that multiple motivational strands can coexist, and potentially conflict with or support each other (Arias-Arévalo, Martín-López, & Gómez-Baggethun, 2017; Winter, 2007). The combination of, say, interdependence and essential POs might produce both outwardly oriented instrumental and intrinsic goals to protect nature, thereby making prosocial and pro-environmental tendencies particularly salient and the respective behaviour more likely than either of them in isolation. In order to formulate and test these kinds of hypotheses, it is necessary to be able to identify and measure the different underlying constructs. The typology presented here is designed as a first step towards this aim.

### 3.5 Conclusion and future directions

Feeling connected to the people and other life forms on our planet may well be a key factor in prosocial and pro-environmental tendencies (ProTs). However, oneness concepts and measures in the literature vary with respect to their scope, psychological ontology, and manifestation, such that it is difficult to compare results between studies. The current chapter offers a typology that can be used to identify similarities and differences in oneness concepts used between studies. It also provides a framework for informing future research. Such research might focus on designing measures that distinguish between the different aspects of
oneness for a given scope (explored in Chapter 4 of the present thesis) and can be used to investigate relations to ProTs (explored in Chapter 5 of the present thesis). Investigating these relationships thoroughly would benefit from an experimental design, which would require the use of prompts that prime particular aspects of oneness. Investigating effective prompts would therefore also be required, and interesting in its own right. This was initially explored in Chapter 2, but is not directly tested again within this thesis due to a shift in emphasis from establishing causation to more thorough conceptual development.

In addition to these quantitative approaches, a deeper understanding of oneness and its relationship to ProTs would benefit from a qualitative approach. This might consist of interviewing people who have had beliefs, feelings, or experiences of the kinds of oneness connections described in the model, to see whether their accounts similarly differentiate between the dimensions. This would be a useful step in the scale construction process alluded to above. In depth interviews were beyond the scope of the present thesis. However, the next chapter presents an initial attempt at scale construction that relies on variation in oneness perceptions that has already been analysed and presented in the literature.
Chapter 4

Factor Analyses and Scale Construction

Overview

The psychological literature contains multiple scales measuring a salient sense of profound connection between the “self” and other entities (i.e., oneness). These scales are useful, because they provide tools for testing the relationships between oneness and a range of important psychological outcomes, including prosocial and pro-environmental tendencies (ProTs, e.g., in the form of values, motivations, and behaviours). A recent review of these oneness scales and their conceptual underpinnings proposed a three-dimensional typology that can be used to understand and compare them (Chapter 3 of the current thesis). The three dimensions are: 1) scope (what entities the oneness phenomenon includes); 2) manifestation (whether the oneness information is contained in a belief, feeling, or experience); and 3) psychological ontology (PO, whether the connection between self and other is perceived to exist in interdependent relationships; the sharing of an “essence” of some kind; or in the expansion of the self to include the other). Here exploratory factor analysis (EFA, Study 1) was used to test whether the different kinds of oneness outlined in the typology form statistically distinct psychological categories. Following the EFA, confirmatory factor analysis (CFA, Study 2) was used on a set of items that was refined based on the results of Study 1 and some re-theorising that took place in between the studies. These two studies took the first step towards empirically refining the oneness typology, and towards constructing a scale that is able to distinguish between the different kinds of oneness therein. Study 2 found good support for the distinctiveness of beliefs/feelings about the three POs for the nature scope, and borderline evidence for their distinctiveness in the humanity scope. Further, general oneness experiences were found consistently to form a unique factor. Although the resulting scales may require further development, they are useful for contributing to the understanding of the relationship between oneness and other psychological phenomena.
4.1 Introduction

We humans have a unique, sometimes uncomfortable ability to contemplate how our existence is connected to the rest of reality. There are multiple physical and temporal scales at which to contextualise our personal existences, and at each scale there are countless concepts/metaphors/narratives that we can use to make sense of our position there. For example, we are individual organisms, shaped by the competitive process of natural selection ultimately to look after ourselves so that we can maximise reproductive success; we are members of our families, and the adage “blood is thicker than water” captures an appropriate sense of loyalty to our perceived kin; we share a common ancestor with all life forms, and we therefore share the same essential “spark of life”; we are embedded within various social groups, from local communities, to cities and countries, on which we depend for safety and a sense of security and belonging; we are just tiny, meaningless clumps of matter in the vast, empty universe; we are a part of a larger, interacting ecosystem with all other life forms; we are all God’s children; we are not merely observers of the universe, but rather we are the universe observing itself. The list could grow indefinitely, and the different ways that people understand their connection to the world at large could be categorised into different themes. A general theme that would emerge is that there is some deep connection between the self and the universe at large or entities within it – a general psychological phenomenon that is here called “oneness”.

There are multiple concepts in the psychological literature that attempt to describe and measure the extent to which people feel or believe they are deeply connected to other entities (although they do not always use the word “oneness”). Chapter 3 of the current thesis reviewed these oneness concepts in the literature, including 20 different self-report oneness measures. Based on the language used in these concepts and measures, a oneness typology was produced to make it easier to compare and understand them. The typology has three dimensions: **scope**, **manifestation**, and **psychological ontology**. **Scope** refers to the entities that a given oneness concept is concerned with, e.g., another individual, a social group, or a more abstract concept like humanity, nature, or all of existence. **Manifestation** refers to the psychological domain in which the oneness information is contained, i.e., beliefs, feelings, or experiences. **Psychological ontology (PO)** refers to the perceived nature of the connection between self and other, i.e., self-expansion to include the other (expansion); self and other forming a larger whole through symbiotic interactions (interdependence); or self and other sharing some kind of “essence” (essential). Not only does the typology help one to compare
and understand the many and varied oneness concepts in the literature, but it also provides a detailed definition of oneness. Oneness, according to the typology, refers to any psychological phenomenon in which one believes, feels, or experiences that one is connected to some other entity, either via self-expansion to include the other, interdependence with the other, or sharing an essence with the other.

In Chapter 3 of the current thesis, the typology was applied to the self-report measures of oneness already in the literature, finding that almost all of them had items referring to more than one sub-dimension of \( PO \), and more than one sub-dimension of manifestation. This apparent conflation of concepts is a potential problem if the sub-dimensions in the typology reflect psychologically distinct constructs.

It is a potential problem for two reasons. The first is that any relationships between oneness and other psychological constructs found using the existing scales would be of a lower specificity than the researchers might have intended, either because the oneness measures used were of a multi-dimensional and therefore more general oneness, or because the oneness measures used were predominately of a different specific kind of oneness than would be theoretically appropriate. The second reason it is problematic is that the different kinds of oneness outlined by the typology might have different relationships with other psychological constructs of interest (e.g., ProTs), and currently there appears to be no measure that adequately distinguishes between the different subcategories in order to test these more specific relationships.

The research presented here begins to address these issues across two studies, using factor analysis to test statistically whether different kinds of oneness in the typology reflect psychologically distinct constructs. In doing so, the first step is taken towards constructing a scale that is able to distinguish between these different kinds of oneness, which can be used in future research to test more specific hypotheses about the relationship between oneness and other psychological constructs of interest.

### 4.2 Overview of the studies

**Study 1**

In Study 1, exploratory factor analysis (EFA) was used to test whether the three \( POs \) form three distinct psychological constructs. The scopes of interest were “nature” and
“humanity”. These are appropriately broad for the general prosocial and pro-environmental tendencies (ProTs) of interest to the primary researcher, and have also been found to form distinct factors in previous research (e.g., Leary et al., 2008). Combining these two scopes with the three manifestations (beliefs, feelings, and experiences) and the three POs (expansion, essential, and interdependence) formed a 2 x 3 x 3 grid, and therefore 18 potential different types of oneness. This created too many variables to work with for an initial attempt at exploring the oneness typology. It would be unreasonable to expect that a factor analysis on items that make relatively subtle distinctions would support an 18-factor solution that aligns with these 18 types of oneness. Therefore, Study 1 focused only on the PO dimension of the typology, with its three subcategories: expansion, interdependence, and essential.

In particular, it was tested whether the three POs each formed a unique factor for each possible pairing of the two scopes (nature and humanity) with the three manifestations (beliefs, feelings, and experiences). For example, for beliefs in oneness with nature, are there three factors aligning with the three POs? Is the same true for experiences of oneness with humanity? And so on. The PO dimension is the focus, because it is the main contribution of oneness typology to the literature. This dimension requires the most attention and refinement in order to be as valuable a contribution as possible.

The PO dimension also has the greatest potential impact on other psychological consequences. For example, the different POs would be expected to have different effects on how one values the other entity in question. That is, through expansion, the other is intrinsically valued because they are considered self. Through interdependence, the other is instrumentally valued because their welfare is of consequential importance to the self. Through essential, the other is intrinsically valued, because if we are essentially the same, then whatever imbues me with intrinsic value is common between us.

The focus on PO is not meant to imply that scope and manifestation are not important. The appropriate level of scope will be governed by the questions of interest to a given study. For example, if a researcher is interested in prosocial behaviour towards a particular group, then some kind of measure of oneness with that group or with humanity in general would be appropriate. If one is interested in pro-environmental motivations, then some measure of oneness with nature or with the specific environment in question would be appropriate (unless the question relates to potential spill-over effects from e.g., oneness with nature to
prosocial motivations). Whether factor analysis differentiates between humanity and nature scopes would therefore have less of a practical implication than whether factor analysis differentiates between the three POs.

Manifestation might also be important. For example, if oneness experiences are fleeting, perhaps they have less of an impact on stable ProTs on their own, and instead might have a longer lasting effect through their effect on longer lasting feelings and beliefs. However, this is a question that relates to the strength or stability of a ProT, while psychological ontology has potential to influence the quality or nature of ProTs.

With this in mind, the general hypothesis for Study 1 is that a factor analysis will support a three-factor model in which each factor aligns with one of the three types of PO, and that this will hold true for each combination of scope and manifestation. This hypothesis is based on the three POs appearing to be conceptually rather distinct. Expansion involves perceiving the other as being part of the self; interdependence involves perceiving the self as being a small part of a larger whole via interrelationships and symbiosis with the other; and essential involves perceiving the self and other as sharing some important, fundamental property.

Further, three of the oneness concepts reviewed in Chapter 3 explicitly isolate a given PO. In particular, Dutcher et al.’s (2007) concept of connectivity with nature and Garfield et al.’s (2014) Oneness Beliefs scale both explicitly isolate shared essence with nature and all of existence respectively; and Friedman’s (1983) self-expansiveness explicitly isolates self-expansion with any entity from a close other to all of existence, even in the past and future. The isolating of a specific PO in these concepts implies that it is a unique construct, so it is not a new idea that there are distinctions to be made along the lines drawn in the typology.

Finally there is some indirect evidence that the three POs are distinct factors. Droseltis and Vignoles’ (2010) review of the place attachment literature supported three similar factors, namely inclusion of place in the self (expansion), inclusion of self in the place (roughly analogous to interdependence, with its property of self-diminishment), and place-self congruity (roughly analogous to essential). Moreover, the pilot study in Chapter 2 of the current thesis, which used the Metapersonal Self-Construal scale and the Connectedness to Nature scale, found that distinguishing between the interdependence and essential items from those measures produced results more consistent with its hypotheses than using the scales in their original format.
Taken together, the general hypothesis is informed by the literature. The more specific hypotheses are outlined at the end of the Study 1 method section.

**Study 2**

In Study 2, the insights gained from Study 1 were used to refine the questionnaire and administer it to a new group of participants. Changes were made to the items, and two changes were made to the way in which some aspects of the oneness typology were conceptualised. In particular, the feeling and belief manifestations were operationally defined as one dimension referring to propositions (whether intuited/felt or believed) about how one is connected to other entities. The experience manifestation was reconceptualised as being pre-interpretation, and therefore free of propositions about the nature of reality. This also created a more elegant design than Study 1. That is, while Study 1 tested for the distinctiveness between the three POs for every combination of three manifestations and two scopes, Study 2 tested for the distinctiveness between the three POs just for the combined belief/feeling manifestation in the two scopes. Study 2 used confirmatory factor analysis to test this general hypothesis. The more specific hypotheses are outlined at the end of the Study 2 method section.

**4.3 Study 1**

**4.3.1 Method**

**Participants**

The participants were 480 undergraduate psychology students at the University of Auckland, with an age range of 17 – 45, mean of 19.38, median of 19, and mode of 18. 343 identified as female, 134 as male, two as other (fluid and nonbinary), and one as Māori (possibly misread the question). Participants took part in the survey as part of their regular weekly tutorial sessions. The survey session was integrated into the course material by introducing students to the concept of factor analysis and the process of scale construction. The research was approved by the University of Auckland Human Participants Ethics Committee.
**Item generation**

Because there were three types of manifestation, three types of PO, and two levels of scope, there were 18 possible ways of combining the three dimensions, each representing a distinct type of oneness captured by the typology. To generate the items, all oneness measures reviewed in Table 3.4 from Chapter 3 of the current thesis were acquired. All items that referred to a specific psychological ontology were extracted from these measures (see Appendix D). The items that were deemed best at capturing a given concept (as conceptualised by the theoretical work behind the oneness typology) were placed into the appropriate cell in an 18 column grid that captured the combinations of the sub-dimensions in the oneness typology. This provided the main material with which the remaining items were constructed. Where possible, items were constructed for each cell in a row that contained an item from an existing scale, such that there was an equivalent item for each cell in a row (i.e., an equivalent item across all types of oneness). This process resulted in seven rows of 18 items that were roughly equivalent across the 18 types of oneness, and five incomplete rows, for a total of 186 items. Five rows were incomplete because for some items it was not possible to write equivalent items across oneness types. Because 186 items would create an unreasonably long survey for the students to complete, the items were distilled down to four items that best captured the concept (again based on the theoretical work behind the oneness typology) for each of the 18 types of oneness, thereby producing a scale consisting of 72 items (see Appendix E). Given the N of 480, the participant to item ratio is 6.7:1, which exceeds the commonly cited ratio of 5:1 (and absolute sample size of 400-500) required to have adequate power in exploratory factor analysis (Osborne & Costello, 2004).

**Procedure**

The setting for the survey was the psychology students’ usual computer tutorial room. There were a total of 10 tutorial sessions throughout the week. An employed tutor was present as usual, as was the principal researcher, Ties Coomber, who ran the lab session. Students sat at a computer and were guided to the Qualtrics questionnaire link. The first page of the questionnaire was the participant information sheet, which reminded students that this was an anonymous questionnaire that was part of the lab material, and that they would be given the opportunity to consent to their data being used for research purposes in the following slide. It was reiterated that the choice to consent to their data being used was
entirely theirs, and that there would be no consequences to them regardless of the choice. Students then completed the questionnaire, working quietly on their own.

The questionnaire items were presented in three blocks, the order of which was counterbalanced across tutorial sessions. The three different blocks were each dedicated to one of the three manifestations. Before the belief block, participants were presented with the following instructions: “In this block, you are asked to respond to each statement according to your beliefs. That is, do you believe the statement to be true? Does it reflect your understanding of reality?” Before the feeling block, participants were presented with the following instructions: “In this block, you are asked to rate each statement according to your feelings or intuitive senses. That is, do you kind of feel as though the statement is true, regardless of your beliefs? For example, sometimes you might feel like you’re not alone even if you believe that you are alone. Go with your gut instinct on these”. Before the experience block, participants were presented with the following instructions: “In this you are asked to rate each statement according to whether you ever experience what’s written in the statement, even if it’s only for a moment. It doesn’t matter what you believe, but what you might have felt before. Go with your gut instinct on these”. The different manifestations were separated and described with these blurbs for the sake of clarity. If questions referring to all three manifestations were pooled together and randomised, there was a risk that the participants might overlook whether the start of the question was, e.g., “I think” or “I feel”. Items were randomized within each block.

### 4.3.1.1 Hypotheses

The general hypothesis was that the three POs are meaningfully distinct in all three manifestations, across the two scopes of nature and humanity. It was hypothesised, therefore, that for every combination of scope and manifestation, a factor analysis would support a three-factor solution in which items referring to expansion loaded onto one factor; items referring to interdependence loaded onto another factor; and items referring to essential loaded onto another factor. This hypothesis can be broken into six more specific hypotheses, one for each combination of scope and manifestation.
H1BN) – Hypothesis 1 belief x nature – In a factor analysis that includes only items that refer to beliefs in particular P0s with nature, those referring to expansion will load onto one factor; those referring to interdependence will load onto another factor; and those referring to essential will load onto yet another factor.

H1FN) – Hypothesis 1 feeling x nature – In a factor analysis that includes only items that refer to feelings of particular P0s with nature, those referring to expansion will load onto one factor; those referring to interdependence will load onto another factor; and those referring to essential will load onto yet another factor.

H1EN) – Hypothesis 1 experience x nature – In a factor analysis that includes only items that refer to experiences of particular P0s with nature, those referring to expansion will load onto one factor; those referring to interdependence will load onto another factor; and those referring to essential will load onto yet another factor.

H1BH, H1FH and H1EH) – As for the three hypotheses above, but with a humanity rather than nature scope.

4.3.2 Results

The results section is structured according to the hypotheses of the research. Each is addressed in turn, and an interpretation is provided after each set of results. Some level of interpretation beyond just reporting the results was deemed necessary in this section, given the quantity of results to report. Saving all interpretation for the discussion would make the interpretation hard to follow.

All analyses were run in the statistical analysis program “R”. All “parallel analyses” were run using the “fa.parallel” function in the “Psych” package, with a minimum residual factoring model. All factor analyses were run using the “fa” function in the “Psych” package, with an “oblimin” rotation, and with a factor loading cutoff of greater than 0.3.
In testing for the number of factors to include in the model, a number of indicators were tested, namely: 1) parallel analysis; 2) shape of the scree plot; and 3) number of factors with an eigenvalue greater than one. Although the results of the parallel analysis were prioritised, other models that found support from the scree plots or eigenvalues were also tested in case they found adequate support from the parameters returned from the exploratory factor analysis itself. Namely, a root mean square residual (RMSR) below 0.08; a root mean square error of approximation (RMSEA) below 0.06; a Tucker Lewis index of factoring reliability (TLI) greater than 0.9; a more simple structure (fewer multi-factor loadings of greater than 0.32); and a statistically non-significant chi-square test at the 0.05 level, although the chi-square test does not carry much weight in deciding on the preferred model. Given the many considerations that contribute to deciding which factor model is the most appropriate, in cases where two solutions were deemed to be sufficiently similar in their support, both solutions were reported. The above criteria for conducting the factor analysis and assessing the model fit were informed by the various recommendations from a range of sources (Hu & Bentler, 1999; Matsunaga, 2010; Schmitt, 2011; B. Thompson, 2004).

**H1: Three psychological ontology factors**

The overarching hypothesis was that the three POs are meaningfully distinct, and this distinctiveness holds in the three manifestations across the two broad scopes of nature and humanity. This informed the more specific predictions that exploratory factor analysis would support a factor for each PO (*interdependence*, *essential*, and *expansion*) in each possible combination of scope and manifestation. In other words, for any given combination of scope and manifestation, when the item pool contained was comprised of one third *interdependence* items, one third *essential* items, and one third *expansion* items, these three groups of items would each form one factor. The results for specific hypotheses relate to each of the possible combinations of scope and manifestation, which are addressed in turn below.

**Hypothesis H1BN) Belief x nature**

For items referring to belief in a oneness connection with nature, where one third of the items referred to *interdependence*, one third referred to *essential*, and one third referred to *expansion*, a parallel analysis suggested that there were four factors. The scree plot (see Appendix F1) showed a levelling of the slope at around Factors 2-4, and only one factor with
an eigenvalue of greater than 1. Taken together, these results suggest that models with 1-4 factors would be reasonable, so these four different models were tested before examining the most supported ones in more detail.

Table 4.1

*Fit indices for the four plausible models as suggested by the parallel analysis and scree plot for belief in oneness with nature*

<table>
<thead>
<tr>
<th>N-factor model</th>
<th>RMSR (&lt; 0.08)</th>
<th>RMSEA (&lt; 0.06)</th>
<th>TLI (&gt; 0.9)</th>
<th>Chi-square</th>
<th>Chi-square p (&gt; 0.05)</th>
<th>Multi-factor loadings &gt; 0.32</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.07</td>
<td>0.09</td>
<td>0.83</td>
<td>294.59</td>
<td>&lt;0.001</td>
<td>NA</td>
</tr>
<tr>
<td>2</td>
<td>0.05</td>
<td>0.08</td>
<td>0.80</td>
<td>171.21</td>
<td>&lt;0.001</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>0.03</td>
<td>0.05</td>
<td>0.95</td>
<td>52.46</td>
<td>0.02</td>
<td>0</td>
</tr>
<tr>
<td>4</td>
<td>0.02</td>
<td>0.03</td>
<td>0.99</td>
<td>19.52</td>
<td>0.72</td>
<td>3</td>
</tr>
</tbody>
</table>

*Note.* RMSR = root mean square residual; RMSEA = root mean square error of approximation; TLI = Tucker Lewis index. The values in brackets represent the thresholds for a good fit.

The results of the four models (Table 4.1) suggest that the three-factor model had reasonable support, with a sufficiently low RMSR and RMSEA, and a sufficiently high TLI and chi-square *p*-value. However, the two-factor model also had sufficiently low RMSR and RMSEA, and sufficiently high TLI, but with a more simple structure (only one item that loaded onto multiple factors compared with three items in the four-factor model). Therefore, the three-factor model was deemed to be better supported and is presented below (see Table 4.2).
Table 4.2

Exploratory factor analysis results for the three-factor model for belief in oneness with nature

<table>
<thead>
<tr>
<th>Factor</th>
<th>Factor 1</th>
<th>Factor 2</th>
<th>Factor 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>SS loadings</td>
<td>1.676</td>
<td>1.464</td>
<td>1.333</td>
</tr>
<tr>
<td>Proportion Var.</td>
<td>0.140</td>
<td>0.122</td>
<td>0.094</td>
</tr>
<tr>
<td>Cumulative Var.</td>
<td>0.140</td>
<td>0.262</td>
<td>0.356</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Item</th>
<th>Factor loadings</th>
<th>Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>Int1</td>
<td>0.38</td>
<td>Humans depend on the environment</td>
</tr>
<tr>
<td>Int2</td>
<td>0.40</td>
<td>I am part of a larger cyclical process of living</td>
</tr>
<tr>
<td>Int3</td>
<td>0.71</td>
<td>I am part of a wider ecosystem with animals and plants</td>
</tr>
<tr>
<td>Int4</td>
<td>0.59</td>
<td>My well-being depends on the well-being of the natural world</td>
</tr>
<tr>
<td>Ess1</td>
<td>0.42</td>
<td>Humans and nature share an “essence” with each other</td>
</tr>
<tr>
<td>Ess2</td>
<td>0.53</td>
<td>I am part of a large family of all life on earth</td>
</tr>
<tr>
<td>Ess3</td>
<td>0.53</td>
<td>All inhabitants of earth, human and non-human, share a common life-force</td>
</tr>
<tr>
<td>Ess4</td>
<td>0.53</td>
<td>I am related to all animals and plants</td>
</tr>
<tr>
<td>Exp1</td>
<td>0.70</td>
<td>I see myself as a larger whole, encompassing all of existence</td>
</tr>
<tr>
<td>Exp2</td>
<td>0.47</td>
<td>The natural world is part of who I am</td>
</tr>
<tr>
<td>Exp3</td>
<td>0.59</td>
<td>If the natural world was destroyed, I would have lost part of myself</td>
</tr>
<tr>
<td>Exp4</td>
<td>0.74</td>
<td>Harm to nature is the same as harm to myself</td>
</tr>
</tbody>
</table>

Note. Int = interdependence; Ess = essential; Exp = expansion; SS loadings = sum of the squared loadings, Proportion Var. = proportion of the variance explained by that factor; Cumulative Var. = variance explained by the model. Italicised items highlight no factor loading of 0.3 or greater on any factor.

The results in Table 4.2 provide good support for hypothesis H1BN. Factor 1 appears to be roughly an expansion factor; Factor 2 an essential factor; and Factor 3 an interdependence factor. There are, however, some exceptions to this pattern. Int4, an interdependence item, loads onto Factor 1, the expansion factor. This could be because it shares a key concept with two of the three expansion items (Exp3 and Exp4), namely that one’s well-being is related in some way to the well-being of the natural world. In particular, Int4 refers to one’s well-being depending on the well-being of the natural world; Exp3 refers the destruction of the natural world as losing part of oneself; and Exp4 refers to harming nature as equivalent to harming the self. Factor 1, therefore, could be argued to represent a tendency to see one’s well-being as related in some way to the well-being of the natural world, rather than expansion per se.

Alternatively, Int4 could be interpreted as an expansion item, because the idea that one’s welfare “depends” on the welfare of the natural world could be taken to represent expansion rather than interdependence. For example, my organs are part of me; if my organs are harmed I am harmed; therefore my welfare depends on the welfare of my organs. Given
that Exp2, an unambiguously *expansion* item, loads onto Factor1, this latter explanation is more likely, and therefore Factor1 is taken as a wholly *expansion* factor. In any case, Int4 should have been written such that it referred more clearly to an *interdependence PO*.

Another exception to the hypothesised factor pattern is that Exp1 loads onto Factor 2, the *essential* factor. Exp1 refers to seeing the self as a larger whole, encompassing all of existence. This item was intended to capture explicitly identifying with a larger, all-encompassing entity. For example, our bodies are made of individual cells that share a common ancestor and form an interacting system, but the default entity with which we identify is the all-encompassing body that emerges from this system of cells, not any of the individual cells on their own. Taking this logic to a larger scale, if a person’s body shares a common ancestor and forms an interacting system with other bodies, then perhaps it is possible to identify with the all-encompassing entity that emerges from this system of bodies. Indeed, this is what concepts like allo-inclusive identity (Leary et al., 2008) and metapersonal self-construal (DeCicco & Stroink, 2007) are based on. Exp1 was intended to capture the tendency to explicitly identify with this larger entity that encompasses all of existence, which is the most literal conceptualisation of *expansion* included in the questionnaire. The problem is that when *expansion* is put in such literal terms, it creates a “spiritual” connotation that people might find difficult to relate to. This is amplified by it being the only *expansion* item to refer to “all of existence” rather than nature/the natural world. Two of the *essential* items that load onto Factor 2 carry a similar “spiritual” connotation, namely sharing an “essence” (Ess1) and a “life-force” (Ess3). Factor 2 therefore appears to lean towards a shared “spiritual” essence with nature, rather than the more inclusive shared spiritual or physical essence with nature.

Finally, Ess4 did not load onto any factor. This item referred to being “related to animals and plants”. Although it was intended to mean genetically related/sharing a common ancestor (and therefore an “essence”), the word “related” could refer to any relationship, including an interdependent one. If it can be interpreted in multiple ways, it would not be expected to load strongly onto only one factor. Future research might benefit from abandoning this item or making it more specific to a particular *psychological ontology*. 
Hypothesis H1FN) Feeling x nature

For items referring to feeling a oneness connection with nature, where one third of the items referred to *interdependence*, one third referred to *essential*, and one third referred to an *expansion*, a parallel analysis suggested that there were three factors. The scree plot (see Appendix F2) showed a levelling of the slope at around Factor 2, and only one factor with an eigenvalue of greater than 1. Taken together, these results suggest that models with 1-3 factors would be reasonable, so these three different models were tested before examining the most supported ones in more detail (see Table 4.3).

Table 4.3

*Fit indices for the four plausible models as suggested by the parallel analysis and scree plot for feeling a sense of oneness with nature*

<table>
<thead>
<tr>
<th>N-factor model</th>
<th>RMSR (&lt; 0.08)</th>
<th>RMSEA (&lt; 0.06)</th>
<th>TLI (&gt; 0.9)</th>
<th>Chi-square</th>
<th>Chi-square p (&gt; 0.05)</th>
<th>Multi-factor loadings &gt; 0.32</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.06</td>
<td>0.09</td>
<td>0.86</td>
<td>255.17</td>
<td>&lt;0.001</td>
<td>NA</td>
</tr>
<tr>
<td>2</td>
<td>0.04</td>
<td>0.07</td>
<td>0.90</td>
<td>117.09</td>
<td>&lt;0.001</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>0.03</td>
<td>0.05</td>
<td>0.95</td>
<td>46.22</td>
<td>0.06</td>
<td>0</td>
</tr>
</tbody>
</table>

*Note.* RMSR = root mean square residual; RMSEA = root mean square error of approximation; TLI = Tucker Lewis index. The values in brackets represent the thresholds for a good fit.

Both the three- and two-factor models had reasonable support. The three-factor model had lower RMSR and RMSEA scores, a higher TLI score, a non-significant chi-square *p*-value, and achieved a perfectly simple structure (no cross loadings of greater than 0.32). Further, the two-factor model’s RMSEA of 0.07 was over the 0.06 level used here, while the three-factor model had an RMSEA of 0.05. Further still, the three factor model achieved a perfectly simple structure, while the two-factor model had one cross-loading over 0.32. Therefore, only the three-factor model is presented below (see Table 4.4).
Table 4.4

**Exploratory factor analysis results for the three-factor model for feeling a sense of oneness with nature**

<table>
<thead>
<tr>
<th>Factor loadings</th>
<th>Item (prefix &quot;I have an intuitive sense that&quot;)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Int1</td>
<td>0.67 Humans depend on the environment</td>
</tr>
<tr>
<td>Int2</td>
<td>0.56 I am part of a larger cyclical process of living</td>
</tr>
<tr>
<td>Int3</td>
<td>0.42 I am part of a wider ecosystem with animals and plants</td>
</tr>
<tr>
<td>Int4</td>
<td>0.63 My well-being depends on the well-being of the natural world</td>
</tr>
<tr>
<td>Ess1</td>
<td>0.56 I am part of a large family of all life on earth</td>
</tr>
<tr>
<td>Ess2</td>
<td>0.53 Inhabitants of earth, human and nonhuman, share a common life force</td>
</tr>
<tr>
<td>Ess3</td>
<td>0.56 I am related to all animals and plants</td>
</tr>
<tr>
<td>Ess4</td>
<td>0.45 I feel a sense of kinship with other life forms in general (no prefix)</td>
</tr>
<tr>
<td>Exp1</td>
<td>0.54 I am a larger whole, encompassing all of existence</td>
</tr>
<tr>
<td>Exp2</td>
<td>0.76 The natural world is part of who I am</td>
</tr>
<tr>
<td>Exp3</td>
<td>0.57 If the natural world was destroyed, I would feel I had lost part of myself</td>
</tr>
<tr>
<td>Exp4</td>
<td>0.65 Harm to nature is the same as harm to myself</td>
</tr>
</tbody>
</table>

**Note.** Int = interdependence; Ess = essential; Exp = expansion; SS loadings = sum of the squared loadings, Proportion Var. = proportion of the variance explained by that factor; Cumulative Var. = variance explained by the model.

The results in Table 4.4 provide weak to moderate support for hypothesis H1FN. In the three-factor model, Factors 1 and 2 contain items from all three POs, and Factor 3 contains just two items, both of which are from the interdependence PO. Observing the items more closely, Factor 1 contains the feeling version of the item that refers to a sense of being related to all animals and plants. As argued in the previous section on hypothesis H1BN, the key word “related” may be too vague to usefully distinguish between the three POs. The same argument could be made for “feeling a sense of kinship”. That is, a “feeling of kinship” might be interpreted in ways other than the intended shared essence. Factor 1 is also loaded with the feeling equivalents of the four items that formed Factor 1 in the analysis for hypothesis H1BN. That is, the two expansion items that focus on the relationship between one’s own well-being and the well-being of the natural world; the one interdependent item that focuses on the same kind of well-being relationship, and an explicit expansion item referring to the natural world being part of the self. Factor 1, therefore, seems to be a combination of predominately expansion, and a general feeling of relatedness/kinship with nature.
Factor 2 is similar to Factor 2 from H1BN. Specifically, the *expansion* item with a more “spiritual” connotation (Exp1) formed a factor with two *essential* items (which also seem to have a spiritual connotation), and an *interdependence* item (Int2) that could be interpreted in a way that is consistent with an *essential PO*, making Factor 2 a factor that generally refers to shared spiritual essence with nature. Factor 3 was roughly an *interdependence* factor, loaded with only the two items that relatively unambiguously refer to the *interdependence PO*. Taken together, the three-factor model for feelings of oneness with nature is roughly the same as the three-factor model for belief in oneness with nature, with a slightly weaker *interdependence* factor and a slightly more general first factor (the *expansion* factor).

**Hypothesis H1EN) Experience x nature**

For items referring to having had an experience of oneness with nature, where one third of the items referred to *interdependence*, one third referred to *essential*, and one third referred to *expansion*, a parallel analysis suggested that there were three factors. The scree plot (see Appendix F3) showed a levelling of the slope at around Factor 3, and only one factor with an eigenvalue of greater than 1. Taken together, these results suggest that models with 1-3 factors would be reasonable, so these three different models were tested before examining the most supported ones in more detail (see Table 4.5).

**Table 4.5**

*Fit indices for the four plausible models as suggested by the parallel analysis and scree plot for experiencing a sense of oneness with nature*

<table>
<thead>
<tr>
<th>N-factor model</th>
<th>RMSR (&lt; 0.08)</th>
<th>RMSEA (&lt; 0.06)</th>
<th>TLI (&gt; 0.9)</th>
<th>Chi-square</th>
<th>Chi-square p (&gt; 0.05)</th>
<th>Multi-factor loadings &gt; 0.32</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.09</td>
<td>0.11</td>
<td>0.74</td>
<td>516.05</td>
<td>&lt;0.001</td>
<td>NA</td>
</tr>
<tr>
<td>2</td>
<td>0.03</td>
<td>0.04</td>
<td>0.96</td>
<td>61.06</td>
<td>0.036</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>0.02</td>
<td>0.03</td>
<td>0.98</td>
<td>43.09</td>
<td>0.41</td>
<td>2</td>
</tr>
</tbody>
</table>

*Note.* RMSR = root mean square residual; RMSEA = root mean square error of approximation; TLI = Tucker Lewis index. The values in brackets represent the thresholds for a good fit.
Both the three- and two-factor models showed reasonable support, with sufficiently low RMSR and RMSEA values, and sufficiently high TLI values. However, the two-factor model had a more simple structure, and was more parsimonious with only two factors. Therefore the results for the two-factor model are shown below (see Table 4.6).

Table 4.6

<table>
<thead>
<tr>
<th></th>
<th>Factor 1</th>
<th>Factor 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>SS loadings</td>
<td>2.36</td>
<td>1.96</td>
</tr>
<tr>
<td>Proportion Var</td>
<td>0.20</td>
<td>0.16</td>
</tr>
<tr>
<td>Cumulative Var</td>
<td>0.20</td>
<td>0.36</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Item</th>
<th>Factor loadings</th>
<th>Item (prefix &quot;I have experienced a sense...&quot;)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Int1</td>
<td>0.67</td>
<td>That I depend on the environment</td>
</tr>
<tr>
<td>Int2</td>
<td>0.35</td>
<td>That I was part of a larger cyclical process of living</td>
</tr>
<tr>
<td>Int3</td>
<td>0.62</td>
<td>That I am part of a large ecosystem with animals and plants</td>
</tr>
<tr>
<td>Int4</td>
<td>0.68</td>
<td>That the well-being of the natural world could affect my own well-being</td>
</tr>
<tr>
<td>Ess1</td>
<td>0.40</td>
<td>That I am part of a large family of all life on earth</td>
</tr>
<tr>
<td>Ess2</td>
<td>0.43</td>
<td>That all inhabitants of earth, human and non-human, share a common life force</td>
</tr>
<tr>
<td>Ess3</td>
<td>0.48</td>
<td>Of kinship with animals and plants</td>
</tr>
<tr>
<td>Ess4</td>
<td>0.42</td>
<td>Of a blurred boundary between myself and the rest of existence</td>
</tr>
<tr>
<td>Exp1</td>
<td>0.55</td>
<td>That my “self” includes all of nature</td>
</tr>
<tr>
<td>Exp2</td>
<td>0.75</td>
<td>I am a larger whole, encompassing all of existence</td>
</tr>
<tr>
<td>Exp3</td>
<td>0.77</td>
<td>Of myself extending into all of existence</td>
</tr>
<tr>
<td>Exp4</td>
<td>0.41</td>
<td>0.35 Of being the natural world around me</td>
</tr>
</tbody>
</table>

Note. Int = interdependence; Ess = essential; Exp = expansion; SS loadings = sum of the squared loadings, Proportion Var. = proportion of the variance explained by that factor; Cumulative Var. = variance explained by the model. Italicised factor loadings highlight multi-factor loadings.

The results in Table 4.6 provide weak support for H1EN. In the two-factor model, essential and expansion items collapsed into Factor 1, while the essential item referring to kinship joined the interdependence items to form Factor 2 (with the exception of the interdependence item that could be interpreted as referring to an essential PO [Int2]). This suggests that at an experiential level, expansion and essential POs might tend to co-occur or be indistinguishable from each other. Another reason why the interdependence items may have tended to form their own factor is that they contain relatively specific statements of fact (e.g., being part of an ecosystem and depending on the environment). These items were written as experience equivalents of beliefs about interdependence with nature. However, in hindsight, as stand-alone items of oneness experiences, they do not have good face validity.
Future research might wish to take this into consideration by using experience items that best capture what oneness experiences tend to feel like, rather than forcing beliefs about interdependence into an experience item for the sake of having equivalent items across dimensions.

**Hypothesis H1BH) Belief x humanity**

For items referring to beliefs in a oneness connection with humanity, where one third of the items referred to *interdependence*, one third referred to *essential*, and one third referred to *expansion*, a parallel analysis suggested that there were three factors. The scree plot (see Appendix F4) showed a levelling of the slope at around Factors 2-3, and only one factor with an eigenvalue of greater than 1. Taken together, these results suggest that models with 1-3 factors would be reasonable, so these three different models were tested before examining the most supported ones in more detail (see Table 4.7).

Table 4.7

*Fit indices for the four plausible models as suggested by the parallel analysis and scree plot for belief in oneness with humanity*

<table>
<thead>
<tr>
<th>N-factor model</th>
<th>RMSR (&lt; 0.08)</th>
<th>RMSEA (&lt; 0.06)</th>
<th>TLI (&gt; 0.9)</th>
<th>Chi-square</th>
<th>Chi-square p (&gt; 0.05)</th>
<th>Multi-factor loadings &gt; 0.32</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.06</td>
<td>0.08</td>
<td>0.85</td>
<td>242.17</td>
<td>&lt;0.001</td>
<td>NA</td>
</tr>
<tr>
<td>2</td>
<td>0.04</td>
<td>0.06</td>
<td>0.92</td>
<td>118.64</td>
<td>0.04</td>
<td>0</td>
</tr>
<tr>
<td>3</td>
<td>0.02</td>
<td>0.03</td>
<td>0.98</td>
<td>32.59</td>
<td>0.49</td>
<td>1</td>
</tr>
</tbody>
</table>

*Note.* RMSR = root mean square residual; RMSEA = root mean square error of approximation; TLI = Tucker Lewis index. The values in brackets represent the thresholds for a good fit.

The three-factor and two-factor models shows reasonable support, with all parameters in an appropriate range, apart from being one multi-factor loading away from a perfectly simple structure. Although the two-factor model had an RMSEA above the 0.06 level, it achieved a perfectly simple structure, so both the two- and three-factor models are presented below (see Table 4.8).
Table 4.8

Exploratory factor analysis results for the three-factor model for belief in oneness with humanity

<table>
<thead>
<tr>
<th></th>
<th>3-factor model</th>
<th>2-factor model</th>
</tr>
</thead>
<tbody>
<tr>
<td>SS loadings</td>
<td>2.49</td>
<td>1.02</td>
</tr>
<tr>
<td>Proportion Var</td>
<td>0.21</td>
<td>0.09</td>
</tr>
<tr>
<td>Cumulative Var</td>
<td>0.21</td>
<td>0.29</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Factor loadings</th>
<th>Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>Int1</td>
<td>0.55 All humans depend on each other, like teammates</td>
</tr>
<tr>
<td>Int2</td>
<td>0.66 I am part of a large network of all people on earth</td>
</tr>
<tr>
<td>Int3</td>
<td>0.58 All people are connected through their interactions with each other</td>
</tr>
<tr>
<td>Int4</td>
<td>0.66 My well-being depends on the well-being of others</td>
</tr>
<tr>
<td>Ess1</td>
<td>0.71 Humans share something essential with each other</td>
</tr>
<tr>
<td>Ess2</td>
<td>0.56 I am part of a large family of all people on earth</td>
</tr>
<tr>
<td>Ess3</td>
<td>0.56 All people come from the same original source</td>
</tr>
<tr>
<td>Ess4</td>
<td>0.66 People share a common humanity</td>
</tr>
<tr>
<td>Exp1</td>
<td>0.76 I see myself as a larger whole, encompassing all people</td>
</tr>
<tr>
<td>Exp2</td>
<td>0.37 0.45 0.77 All people are part of who I am</td>
</tr>
<tr>
<td>Exp3</td>
<td>0.44 0.33 If all people on earth disappeared, I’d have lost part of myself</td>
</tr>
<tr>
<td>Exp4</td>
<td>0.45 0.55 Harm to other people is the same as harm to myself</td>
</tr>
</tbody>
</table>

Note. Int = interdependence; Ess = essential; Exp = expansion; SS loadings = sum of the squared loadings, Proportion Var. = proportion of the variance explained by that factor; Cumulative Var. = variance explained by the model. Italicised items highlight that in at least one model the item did not have a factor loading of > 0.3 on any factor. Italicised factor loadings highlight multi-factor loadings within a model.

These results in Table 4.8 provide weak support for H1BH. In the three-factor model, Factor 1 is loaded with all of the essential items (except Ess3, which did not meet the 0.32 factor loading threshold), and three out of the four interdependence items. This suggests that perceived interdependence with other people tends to co-occur with perceived shared essence, at least when shared essence is portrayed as being part of a family, sharing a common humanity, and more explicitly “sharing something essential” with other people.

Factor 2 is predominately an expansion factor, being loaded with three of the four Expansion items. Factor 2 also contains the one interdependence item that did not load onto Factor 1. The one interdependence item refers to one’s well-being depending on the well-being of others. Exp3 and Exp4 have a similar theme of one’s well-being being related in some way to the well-being of other people. Exp2, which is more explicitly an expansion item, loads more strongly onto Factor 3 with the other more explicit expansion item (Exp1). Factor 2, therefore, might more appropriately be considered a factor that captures the extent
to which people believe their welfare depends on others (regardless of the PO), while Factor 3 is closer to a pure expansion factor, albeit one loaded with only two items.

The two-factor model displays a similar trend for essential and interdependence items to load onto the same factor (Factor 1), and the expansion items to form a unique factor. In this model, the separate well-being factor is no longer present, with Int4 not loading onto any factor, Exp3 loading weakly onto Factor 1, and Exp4 joining the more explicit expansion items (Exp1 and Exp2) in the expansion factor (Factor 2). Taken together, these results suggest that for oneness with humanity, interdependence and essential POs might be best conceptualised as one construct, while expansion might be best considered something separate.

Hypothesis H1FH) Feeling x humanity

For items referring to feeling a oneness connection with humanity, where one third of the items referred to interdependence, one third referred to essential, and one third referred to expansion, a parallel analysis suggested that there were three factors. The scree plot (see Appendix F5) showed a levelling of the slope at around Factor 2, and only one factor with an eigenvalue of greater than 1. Taken together, these results suggest that models with 1-3 factors would be reasonable, so these three different models were tested before examining the most supported ones in more detail (see Table 4.9).

Table 4.9

<table>
<thead>
<tr>
<th>N-factor model</th>
<th>RMSR (&lt;0.08)</th>
<th>RMSEA (&lt;0.06)</th>
<th>TLI (&gt;0.9)</th>
<th>Chi-square</th>
<th>Chi-square p (&gt;0.05)</th>
<th>Multi-factor loadings &gt; 0.32</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.06</td>
<td>0.09</td>
<td>0.85</td>
<td>259.94</td>
<td>&lt;0.001</td>
<td>NA</td>
</tr>
<tr>
<td>2</td>
<td>0.04</td>
<td>0.07</td>
<td>0.91</td>
<td>114.74</td>
<td>0.04</td>
<td>0</td>
</tr>
<tr>
<td>3</td>
<td>0.03</td>
<td>0.05</td>
<td>0.95</td>
<td>45.01</td>
<td>0.08</td>
<td>1</td>
</tr>
</tbody>
</table>

*Note. RMSR = root mean square residual; RMSEA = root mean square error of approximation; TLI = Tucker Lewis index. The values in brackets represent the thresholds for a good fit.*
The three-factor model had reasonable support, although it did not achieve a perfectly simple structure. The two-factor structure had similar support, despite the significant chi-square $p$-value and higher RMSEA value. However, the two-factor model did achieve a perfectly simple structure, so both the two-factor and three-factor models are presented below (see Table 4.10).

### Table 4.10

**Exploratory factor analysis results for the three-factor model for feeling a sense of oneness with humanity**

<table>
<thead>
<tr>
<th>Factor loadings</th>
<th>Item (prefix “I have an intuitive sense that…”)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Factor A1</strong></td>
<td>Int1 0.54 All humans depend on each other, like teammates</td>
</tr>
<tr>
<td><strong>Factor A2</strong></td>
<td>Int2 0.54 I am part of a large network of all people on earth</td>
</tr>
<tr>
<td><strong>Factor A3</strong></td>
<td>Int3 0.78 All people are connected through their interactions with each other</td>
</tr>
<tr>
<td><strong>Factor B1</strong></td>
<td>Int4 0.56 My well-being depends on the well-being of others</td>
</tr>
<tr>
<td><strong>Factor B2</strong></td>
<td>Ess1 0.61 Humans share something essential with each other</td>
</tr>
<tr>
<td><strong>Factor C</strong></td>
<td>Ess2 0.59 I am part of a large family of all people on earth</td>
</tr>
<tr>
<td><strong>Factor D</strong></td>
<td>Ess3 0.52 People share a common humanity</td>
</tr>
<tr>
<td><strong>Factor E</strong></td>
<td>Ess4 0.39 I feel a sense of kinship with people in general (no prefix)</td>
</tr>
<tr>
<td><strong>Factor F</strong></td>
<td>Exp1 0.68 I am a larger whole, encompassing people</td>
</tr>
<tr>
<td><strong>Factor G</strong></td>
<td>Exp2 0.70 All people are part of who I am</td>
</tr>
<tr>
<td><strong>Factor H</strong></td>
<td>Exp3 0.49 If all people on earth disappeared, I would feel I had lost part of myself</td>
</tr>
<tr>
<td><strong>Factor I</strong></td>
<td>Exp4 0.43 Harm to other people is the same as harm to myself</td>
</tr>
</tbody>
</table>

**Note.** Int = interdependence; Ess = essential; Exp = expansion; SS loadings = sum of the squared loadings, Proportion Var. = proportion of the variance explained by that factor; Cumulative Var. = variance explained by the model. Italicised factor loadings highlight multi-factor loadings within a model.

These results for the feeling manifestation provide weak support for H1FH, and reveal a similar pattern as that found for the belief manifestation in H1BH. In particular, there was a general trend for the interdependence and essential items to load onto Factor 1; and the expansion items to load onto Factor 2. In the three-factor model, Int4 and Exp4 both refer to one’s well-being in some way, and both load onto Factor 3. Therefore, for the feeling manifestation, it seems that Factor 2 is the main expansion factor while Factor 3 is a factor that captures the extent to which someone feels their well-being is related in some way to the
well-being of the wider human community (which is the opposite way around to the results from the beliefs manifestation in H1BH).

In the two-factor model, Factor 1 remains as a largely interdependence and essential combined factor (including the “well-being” items), while Factor 2 remains a largely expansion factor, with the addition of the essential item referring to feeling part of a large family of all people on earth. This suggests that the concept of family is not as unambiguously related to an essential PO as was intended. The general pattern of these results suggests for the feeling manifestation with a humanity scope, interdependence and essential POs might be best thought of as one construct, with expansion (and feeling part of a family with all people) as another construct.

Hypothesis H1EH) Experience x humanity

For items referring to experiences of oneness with humanity, where one third of the items referred to interdependence, one third referred to essential, and one third referred to expansion, a parallel analysis suggested that there were three factors. The scree plot (see Appendix F6) showed a levelling of the slope at around Factor 3, and only one factor with an eigenvalue of greater than 1. Taken together, these results suggest that models with 1-3 factors would be reasonable, so these three different models were tested before examining the most supported ones in more detail (see Table 4.11).

Table 4.11

Fit indices for the four plausible models as suggested by the parallel analysis and scree plot for experiencing a sense of oneness with humanity

<table>
<thead>
<tr>
<th>N-factor model</th>
<th>RMSR (&lt; 0.08)</th>
<th>RMSEA (&lt; 0.06)</th>
<th>TLI (&gt; 0.9)</th>
<th>Chi-square</th>
<th>Chi-square p (&gt; 0.05)</th>
<th>Multi-factor loadings &gt; 0.32</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.09</td>
<td>0.11</td>
<td>0.76</td>
<td>507.56</td>
<td>&lt;0.001</td>
<td>NA</td>
</tr>
<tr>
<td>2</td>
<td>0.03</td>
<td>0.05</td>
<td>0.95</td>
<td>72.28</td>
<td>&lt;0.01</td>
<td>0</td>
</tr>
<tr>
<td>3</td>
<td>0.02</td>
<td>0.03</td>
<td>0.98</td>
<td>35.39</td>
<td>0.36</td>
<td>0</td>
</tr>
</tbody>
</table>

Note. RMSR = root mean square residual; RMSEA = root mean square error of approximation; TLI = Tucker Lewis index. The values in brackets represent the thresholds for a good fit.
The three-factor model showed reasonable support, with all parameters in an appropriate range, and achieving a perfectly simple structure. Although the two-factor model had a chi-square $p$-value of below 0.05, it still had reasonable support and also achieved a perfectly simple structure. Therefore, both the three- and two-factor models are presented below (see Table 4.12).

Table 4.12

**Exploratory factor analysis results for the three-factor model for experiencing a sense of oneness with humanity**

<table>
<thead>
<tr>
<th>SS loadings</th>
<th>Proportion Var</th>
<th>Cumulative Var</th>
</tr>
</thead>
<tbody>
<tr>
<td>Factor A1</td>
<td>Factor A2</td>
<td>Factor A3</td>
</tr>
<tr>
<td>2.26</td>
<td>1.32</td>
<td>0.74</td>
</tr>
<tr>
<td>Factor B1</td>
<td>Factor B2</td>
<td></td>
</tr>
<tr>
<td>2.73</td>
<td>1.62</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Item (prefix “I have experience a sense...”)</th>
</tr>
</thead>
<tbody>
<tr>
<td>That I depend on other people in general</td>
</tr>
<tr>
<td>That I am part of a larger network of all people on earth</td>
</tr>
<tr>
<td>That all people are connected through their interactions with each other</td>
</tr>
<tr>
<td>That the well-being of others could affect my own well-being</td>
</tr>
<tr>
<td>Of kinship with people in general</td>
</tr>
<tr>
<td>That I was part of a large family of all people on earth</td>
</tr>
<tr>
<td>That all people share a common humanity</td>
</tr>
<tr>
<td>Of a blurred boundary between myself and the rest of humanity</td>
</tr>
<tr>
<td>That my “self” includes all humans</td>
</tr>
<tr>
<td>That I am a larger whole, encompassing all people</td>
</tr>
<tr>
<td>Of myself extending into all of humanity</td>
</tr>
<tr>
<td>That all people are a part of who I am</td>
</tr>
</tbody>
</table>

Note. Int = interdependence; Ess = essential; Exp = expansion; SS loadings = sum of the squared loadings, Proportion Var. = proportion of the variance explained by that factor; Cumulative Var. = variance explained by the model.

These results provide weak support for H1EH. In the three-factor model, Factor 1 contains all the expansion items and two of the essential items. Factors 2 and 3 both contain two interdependence items and one essential item. Looking at the items more closely, the two essential items that form a factor with the expansion items are the one referring to being part of a large family with all people (consistent with the feeling manifestation in H1FH), and the one referring to a blurred boundary between self and the rest of humanity (which could be interpreted as being an expansion item, particularly with its more “spiritual” connotation). The main factor for experiences of oneness with humanity, therefore, appears to be predominately expansion and a sense of family.
In the two-factor model, Factor 1 is similarly predominately an expansion factor, with “family” and being part of a network included, while Factor 2 is a combination of interdependence and essential items. The tendency for expansion items and items with a more “spiritual” connotation to load onto Factor 1 suggests an experience manifestation is more appropriately paired with the more abstract, “spiritual” kind of language used in most of the expansion items and some of the essential items. This is consistent with the language used in pre-existing scales that measure oneness experiences. The more specific, “concrete” concepts used in interdependence items are perhaps better suited to a belief manifestation.

### 4.3.3 Discussion

On the whole, these results did not provide strong support for the distinctness of the three types of PO in the oneness typology. The most promising results were found for the belief x nature combination in H1BN, in which the items loaded roughly according to the three POs. For the feeling x nature combination in H1FN, there were similar results to H1BN, but with a combination of expansion and general oneness for Factor 1; a spiritual connotation for Factor 2; and a relatively weak interdependence Factor 3. For the experience x nature combination in H1EN, the distinctions between the POs were even less clear, with support being found for only two factors. In particular, expansion and essential loaded together on Factor 1, while Factor 2 was predominately an interdependence factor.

For the humanity scope, with the belief and feeling manifestations (hypotheses H1BH and H1FH), there was a tendency for interdependence and essential items to load onto one factor, while expansion items loaded onto another. When the humanity scope was combined with the experience manifestation, there was a tendency for expansion and essential items to load onto one factor, while interdependence items loaded onto another.

A general methodological issue relating to the method of item generation might partly underpin the problematic results. As described in the methods section, items were generated by finding or distilling particularly good examples of items that measured a specific type of oneness, and then writing rough equivalents of that item across all other specific types of oneness in that row (see Appendix E). For example, the belief x nature x interdependence item “I am part of a wider ecosystem with animals and plants”, was transformed into an equivalent feeling x nature x interdependence item “I have an intuitive sense that I am part of a wider ecosystem with animals and plants”, and an equivalent experience x nature x
interdependence item “I have experienced a sense that I am part of a wider ecosystem with animals and plants”.

The problem with this method is that it led to the creation of some items that, in retrospect, did not capture what a given type of oneness is really like. For example, items that have been used in existing scales to measure oneness experiences (e.g., Hood, 1975; MacDonald, 2000a; MacDonald, 2000b; MacLean et al., 2012), tend to use more poetic, metaphorical language – language that does not distinguish between different POs, but that does somewhat capture an otherwise relatively indescribable experience. The experience item used as an example here, on the other hand, refers to quite a specific proposition about being part of an ecosystem, and simply adds as a prefix “I have experienced a sense that”. It is not clear whether this prefix is enough to turn a belief item into an item that captures what oneness experiences feel like. Similar issues may apply to the feeling manifestation, in which “I have an intuitive sense that” was in some cases simply added to the start of a belief item. Study 2 addressed this shortcoming by focusing more on face validity of items than on making item sets equivalent across oneness types.

Further, some concepts may not have been as precise a reflection of their respective POs as was intended. For example, kinship, family, and being or feeling related to others were all intended to reflect an essential PO. In hindsight, feeling related to others and a sense of kinship is possibly more open to interpretation than is necessary for the kinds of subtle distinctions that this analysis was trying to detect, and the concept of family might also represent different kinds of relationships with different valences to different people. This vagueness might partly explain why items with these key words clustered with items from other POs. Study 2 addressed this issue by being more careful to use language that refers more specifically to the intended PO.

4.4 Study 2

In Study 2, the set of items was refined based on the insights gained from the results of Study 1, in addition to some rethinking of the theoretical and operational definitions of some aspects of the oneness typology. In particular, the experience manifestation was reconceptualised as being unable to distinguish between the three different POs. Oneness experiences are typically described as ineffable (MacLean et al., 2012), and as such they are
typically measured using items using metaphorical language that does not necessarily distinguish between the three *POs* (e.g., Hood, 1975; MacDonald, 2000a; MacDonald, 2000b; MacLean et al., 2012). The attempt to distinguish between the three *POs* in the experience manifestation in Study 1 led to items that did not have particularly good face validity for what oneness experiences really feel like. Consistent with this, the items that more closely resembled items that are typically used to measure oneness experiences (predominately those from the *expansion* and *essential* *POs*) loaded onto Factor 1, and the ones with more specific, knowledge-based relationships between self and nature/humanity (predominately those from the *interdependence* *PO*) loaded onto Factor 2. The items for the experience manifestation were therefore adjusted to reflect the ineffable nature of oneness experiences, by basing them more closely on items used in measures of oneness experience that are already established.

The updated hypothesis for the experience manifestation of oneness was that it is a potential creator or reinforcer of more stable oneness beliefs and feelings that can extend beyond the end of the fleeting experience itself. Moreover, although oneness experiences may not themselves distinguish between the different *POs*, they have the ability to create or reinforce beliefs and feelings about all three *POs*, depending on the existing knowledge and salient language/metaphors/stories that are used to interpret them. Given this updated theoretical conceptualisation, the hypothesis for the experience manifestation in Study 2 was that it would form its own unique factor to beliefs and feelings about the three *POs*.

Regarding the beliefs and feelings manifestations, their theoretical definitions were kept the same. That is, it was tentatively maintained that both beliefs and feelings about oneness can distinguish between the three *POs*. However, the focus of the scale construction was turned completely towards distinguishing between the three *POs*, in order to create a scale that is best suited for testing their differential effects on prosocial and pro-environmental tendencies (ProTs). Attempting to distinguish between oneness beliefs and feelings complicated this primary goal. With this goal in mind, the operational definitions of the beliefs and feelings manifestations were altered. In particular, the beliefs and feelings manifestations were combined by using the prefix “I feel that”, as opposed to using a set of items for beliefs (“I believe that”) and a set for feelings (“I have an intuitive sense that”). This prefix was intended to capture both beliefs and feelings. That is, in everyday use, the prefix “I feel that” is often used to express a belief, but it is also not so concrete that it would deter people with oneness intuitions from relating to the item. The theoretical difference between
beliefs and feelings may simply be too subtle to be distinguished by a simple change in prefix on a self-report questionnaire.

The content of the belief/feeling items after the prefix was also adjusted. In particular, some key words like “kinship”, “family” and “related” were not used, as they were in retrospect deemed not to adequately isolate their intended PO. For example, the word “related” is likely to be more general or vague than intended, as it could refer to multiple POs, not just the intended essential PO. Attention was drawn to these problematic key words by the results of Study 1, which found a tendency for items containing these kinds of key words to cluster with items from other POs. It is not that these words do not capture oneness beliefs and feelings, but rather that they are not able to make the kinds of distinctions that the present research is trying to make. If one was to make a general oneness scale that was not concerned with isolating between the POs, these key words may be appropriate.

The hypothesis for the combined belief/feeling manifestation was therefore that they represent more stable manifestations of oneness that, unlike oneness experiences, can distinguish between the different POs. The updated hypothesis is that items that capture beliefs/feelings about the three different POs will form three different factors in both the nature and humanity domain, in addition to a separate general experience factor.

4.4.1 Method

Participants

The participants were 102 undergraduate psychology students at the University of Auckland, with an age range of 18 – 47, mean of 21.1, median of 20, and mode of 20. 73 identified as female, 27 as male, 2 as other (non-binary and not specified). Participants voluntarily took part in the survey for course credit, as part of an “Experiential Learning Component” of their stage two psychology course. The research was approved by the University of Auckland Human Participants Ethics Committee.

Item generation

The items for Study 2 were based on the items used in Study 1 in addition to the list of items from the pre-existing measures that were used to generate the items for Study 1. In Study 2, the belief and feeling manifestations were collapsed into one category, keeping
experiences separate. Experiences were reconceptualised as being unable to distinguish between the three psychological ontologies (POs). Therefore, items reflecting the three POs were only written for the collapsed belief/feeling manifestation. A set of these items was written for nature, and another set for humanity, with a focus on selecting the most appropriate items for that particular combination of PO and scope, rather than attempting to write equivalents across categories. This led to a total of 7 categories of items: expansion, interdependence, and essential categories for each of the nature and humanity scopes, and one general oneness experience category. While items for the first six categories were based on Study 1, items for the experience category were based predominately on pre-existing scales that exclusively measure oneness experiences (e.g., MacDonald, 2000a; MacDonald, 2000b; MacLean et al., 2012). The items for the six belief/intuition categories began with “I feel that…”, and the experience items began with “I have had an experience in which…”. The resulting items are presented in Table 4.13, with these two broad prefixes at the start of the appropriate sections.
### Table 4.13

**The raw item set for Study 2, compiled based on the results of Study 1 and further theorising**

<table>
<thead>
<tr>
<th>Item name</th>
<th>Prefix: I feel that...</th>
</tr>
</thead>
<tbody>
<tr>
<td>ExpN1</td>
<td>My “self” is extended into the natural world</td>
</tr>
<tr>
<td>ExpN2</td>
<td>Nature is a part of myself</td>
</tr>
<tr>
<td>ExpN3</td>
<td>If part of the natural world was destroyed, I would have lost a part of myself</td>
</tr>
<tr>
<td>IntN1</td>
<td>The natural world is an interacting community to which I belong</td>
</tr>
<tr>
<td>IntN2</td>
<td>My actions affect the natural world, and the natural world affects me</td>
</tr>
<tr>
<td>IntN3</td>
<td>Nature is one big ecosystem, of which I am a part</td>
</tr>
<tr>
<td>EssN1</td>
<td>There is a unifying force in the universe which brings everything together into one great whole</td>
</tr>
<tr>
<td>EssN2</td>
<td>A vital thread of life joins all beings on earth</td>
</tr>
<tr>
<td>EssN3</td>
<td>All of existence is part of a single, unfolding reality</td>
</tr>
<tr>
<td>EssN4</td>
<td>All inhabitants of Earth, human and non-human, share a common ‘life-force’</td>
</tr>
<tr>
<td>ExpH1</td>
<td>The human community is part of myself</td>
</tr>
<tr>
<td>ExpH2</td>
<td>I am extended into the human community</td>
</tr>
<tr>
<td>ExpH3</td>
<td>Other people’s suffering is my suffering</td>
</tr>
<tr>
<td>IntH1</td>
<td>All of humanity is an interacting community to which I belong</td>
</tr>
<tr>
<td>IntH2</td>
<td>I am part of a large network of all people on earth</td>
</tr>
<tr>
<td>IntH3</td>
<td>All humans depend on each other</td>
</tr>
<tr>
<td>EssH1</td>
<td>People share a common humanity</td>
</tr>
<tr>
<td>EssH2</td>
<td>Humans share something essential with each other</td>
</tr>
<tr>
<td>EssH3</td>
<td>On a deep level, all people share a common bond</td>
</tr>
<tr>
<td>Experience1</td>
<td>My sense of separate identity seemed to dissolve into something larger than itself</td>
</tr>
<tr>
<td>Experience2</td>
<td>I seemed to be deeply connected to everything</td>
</tr>
<tr>
<td>Experience3</td>
<td>I felt everything in the world to be part of the same whole</td>
</tr>
<tr>
<td>Experience4</td>
<td>I seemed to go beyond my normal everyday sense of self</td>
</tr>
<tr>
<td>Experience5</td>
<td>I realised the oneness of myself with all things</td>
</tr>
<tr>
<td>Experience6</td>
<td>I felt myself to be absorbed as one with all things</td>
</tr>
</tbody>
</table>

### Procedure

The survey was created in Qualtrics and distributed online amongst an array of other potential studies that students could participate in for course credit. Students who chose to participate in this study followed a link that took them to the survey. The first page of the survey presented a participant information sheet, which emphasised that the survey was completely anonymous, and that they could stop at any time. However, to receive their course credit they were required to complete the survey. They could withdraw and choose a different survey if they chose. After consenting to their data being used for research purposes, they were presented with the questionnaire containing the items in Table 4.13 above. First, participants were presented with the belief/feeling items, followed by the experience items. Before being presented with the belief/feeling items, they were presented with the following instructions: “Please answer each of these questions according to the way you generally feel.”
There are no right or wrong answers. Simply state as honestly and candidly as you can what you generally feel. At the top of the page it says ‘I feel that…’ to encourage you to go with your gut instinct about the statements that follow”. Before being presented with the experience items, participants were presented with the following statement: “In this block, you are asked to rate each statement according to whether you’ve ever had an experience of the kind described”. At the top of the page of experience items was written, “I have had an experience in which…” to be concise and avoid having that prefix at the start of every statement. Within each of the two blocks of items, the item order was randomised.

This was part of a longer survey that included items measuring prosocial and pro-environmental tendencies (ProTs). Most of the results related to these other measures are presented in Chapter 5 of the current thesis. However, two dimensions of Schultz’s (2001) Environmental Concern scale were used in this study as preliminary measure of the extent to which the different psychological ontologies (POs) differentially relate to ProTs. The specifics of these hypothesised relationships with different levels of environmental concern are outlined in the hypotheses section below. These other measures were presented after the items related to the research presented here.

4.4.1.1 Hypotheses

Hypothesis H2a

Based on the results of Study 1, and on the theoretical work in Chapter 3, which identified three types of perceived oneness connection (psychological ontology [PO]) implicit in the oneness literature, the main prediction was that a factor analysis would support the distinctness of these three types of PO, with oneness experiences forming its own factor. This was tested using three sets of items: one group relating to oneness with nature; one group relating to oneness with humanity; and one group relating oneness experiences that did not differentiate between nature or humanity, nor between the different POs. To test whether the three POs form three distinct factors, this hypothesised factor structure was compared to all other possible combinations of POs, that is 1) ExpInt and Ess, 2) ExpEss and Int, 3) EssInt and Exp, and 4) ExpIntEss. These comparisons were made for both the nature and humanity scopes. To test whether experiences form a unique factor to beliefs/feelings about the three POs, and to provide further evidence for the distinctiveness of the three POs, the hypothesised seven factor structure (ExpN, EssN, IntN, ExpH, EssH, IntH, and Experience)
was compared to the four most obvious alternative factor structures, that is 1) ExpIntEssN, ExpIntEssH, and Experience, 2) ExpIntEssNExperience and ExpIntEssH, 3) ExpIntEssN and ExpIntEssHExperience, and 4) one inclusive factor. The model fit indices of the predicted factor structures were compared to those of the alternative factor structures outlined above. The more specific hypotheses are outlined below.

**H2aN) Only nature items**

The hypothesised factor structure was three factors – one for each PO. This factor structure was hypothesised to have a better fit than the most obvious alternative factor structures, namely 1) ExpIntN and EssN, 2) ExpEssN and IntN, 3) EssIntN and ExpN, and 4) an all inclusive factor ExpIntEssN.

**H2aH) Only humanity items**

The hypothesised factor structure was three factors – one for each PO. This factor structure was hypothesised to have a better fit than the most obvious alternative factor structures, namely 1) ExpIntH and EssH, 2) ExpEssH and IntH, 3) EssIntH and ExpH, and 4) an all inclusive factor ExpIntEssH.

**H2aNHE) Nature, humanity, and experience items**

The hypothesised factor structure was seven factors – one for each PO for both nature and humanity, and one for experience. This factor structure was hypothesised to have a better fit than the most plausible alternative factor structures, namely 1) ExpIntEssN, ExpIntEssH, and Experience, 2) ExpIntEssNExperience and ExpIntEssH, 3) ExpIntEssN and ExpIntEssHExperience, and 4) one all inclusive factor.

**Hypothesis H2b**

One justification for the implementation of the oneness typology was that the different types of PO might differentially affect prosocial and pro-environmental tendencies (ProTs). This was tested here using Schultz’s (2001) three kinds of environmental concern – biospheric, altruistic, and egoistic concern. Biospheric concern refers to being concerned
about environmental issues because of the potential effects to other natural entities, like plants and animals. Altruistic concern refers to being concerned about environmental issues because of the potential effects to other people. Egoistic concern refers to being concerned about environmental issues because of the potential effects to the self. Biospheric concern therefore is a measure of intrinsically valuing the environment, while altruistic and egoistic concern are measures of instrumentally valuing the environment. Altruistic concern also acts as a proxy measure of intrinsically valuing other people in general. Given that expansion and essential POs were theorised to produce a sense of intrinsically valuing the other, expansion and essential POs with a nature scope were hypothesised to correlate with biospheric concern, while an interdependence PO with a nature scope was hypothesised to correlate with altruistic and egoistic concerns. Similarly, expansion and essential POs (but not interdependence) with a humanity scope were hypothesised to predict altruistic concern. Confirming these hypotheses would also constitute initial evidence of discriminant validity.

4.4.2 Results

_Hypothesis H2a_

The following results (Tables 4.14-4.16) were produced using “R”. Confirmatory factor analyses were run in the “Lavaan” package using the “cfa” function, setting “std.lv=TRUE” to standardize the latent factors. The fit index guidelines from Study 1 were also applied to Study 2, namely a non-significant chi-square statistic; a TLI and CFI of at least 0.9, a standardized root mean square residual (SRMR) cut off of around 0.08, and an RMSEA cut off of around 0.06. Difference in chi-square tests were performed to more formally assess the difference between hypothesised models and their respective alternative models. A significant result ($p < 0.05$) indicates that the goodness of fit is significantly different between models.
Table 4.14

Confirmatory factor analysis results for the nature scope and the humanity scope

<table>
<thead>
<tr>
<th>Model</th>
<th>Factor structure</th>
<th>( \chi^2 ) (df)</th>
<th>( \chi^2 ) p-value</th>
<th>CFI</th>
<th>TLI</th>
<th>RMSEA (90% CI)</th>
<th>RMSEA CI p-value</th>
<th>SRMR</th>
<th>Difference in ( \chi^2 ) (p-value)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nature items only</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Three hypothesised factors</td>
<td>1) ExpN 2) IntN 3) EssN</td>
<td>34.07 (32)</td>
<td>0.37</td>
<td>0.99</td>
<td>0.99</td>
<td>0.03 (0.00 – 0.08)</td>
<td>0.73</td>
<td>0.05</td>
<td>NA</td>
</tr>
<tr>
<td>Two factors a</td>
<td>1) ExpIntN 2) EssN</td>
<td>49.25 (34)</td>
<td>0.04</td>
<td>0.95</td>
<td>0.93</td>
<td>0.07 (0.02 – 0.10)</td>
<td>0.23</td>
<td>0.06</td>
<td>15.18 (0.001)</td>
</tr>
<tr>
<td>Two factors b</td>
<td>1) ExpEssN 2) IntN</td>
<td>72.45 (34)</td>
<td>&lt;0.001</td>
<td>0.87</td>
<td>0.83</td>
<td>0.11 (0.07 – 0.14)</td>
<td>0.003</td>
<td>0.09</td>
<td>38.38 (0.001)</td>
</tr>
<tr>
<td>Two factors c</td>
<td>1) IntEssN 2) ExpN</td>
<td>55.13 (34)</td>
<td>0.01</td>
<td>0.93</td>
<td>0.91</td>
<td>0.08 (0.04 – 0.11)</td>
<td>0.10</td>
<td>0.07</td>
<td>21.06 (0.001)</td>
</tr>
<tr>
<td>One factor</td>
<td>1) All items</td>
<td>78.04 (35)</td>
<td>&lt;0.001</td>
<td>0.86</td>
<td>0.82</td>
<td>0.11 (0.08 – 0.14)</td>
<td>0.001</td>
<td>0.09</td>
<td>43.97 (0.001)</td>
</tr>
<tr>
<td>Humanity items only</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Three hypothesised factors</td>
<td>1) ExpH 2) IntH 3) EssH</td>
<td>22.44 (24)</td>
<td>0.55</td>
<td>0.99</td>
<td>0.98</td>
<td>0.00 (0.00 – 0.07)</td>
<td>0.85</td>
<td>0.05</td>
<td>NA</td>
</tr>
<tr>
<td>Two factors a</td>
<td>1) ExpIntH 2) EssH</td>
<td>24.82 (26)</td>
<td>0.63</td>
<td>0.98</td>
<td>0.97</td>
<td>0.00 (0.00 – 0.07)</td>
<td>0.84</td>
<td>0.05</td>
<td>2.38 (0.30)</td>
</tr>
<tr>
<td>Two factors b</td>
<td>1) ExpEssH 2) IntH</td>
<td>27.50 (26)</td>
<td>0.38</td>
<td>0.97</td>
<td>0.96</td>
<td>0.02 (0.00 – 0.08)</td>
<td>0.73</td>
<td>0.05</td>
<td>5.06 (0.08)</td>
</tr>
<tr>
<td>Two factors c</td>
<td>1) IntEssH 2) ExpH</td>
<td>25.31 (26)</td>
<td>0.50</td>
<td>0.98</td>
<td>0.98</td>
<td>0.00 (0.00 – 0.71)</td>
<td>0.82</td>
<td>0.05</td>
<td>2.87 (0.24)</td>
</tr>
<tr>
<td>One factor from EFA</td>
<td>1) ExpIntEssH</td>
<td>28.22 (27)</td>
<td>0.40</td>
<td>0.97</td>
<td>0.96</td>
<td>0.02 (0.00 – 0.8)</td>
<td>0.75</td>
<td>0.05</td>
<td>5.78 (0.12)</td>
</tr>
</tbody>
</table>

Note. The hypothesised factor structure and the plausible alternatives are presented in the two left-most columns. Exp = expansion; Int = interdependence; Ess = essential; N/H as suffix = nature/humanity scope. A good fit is indicated by chi-square (\( \chi^2 \)) p-values of > 0.05; Confirmatory Fit index (CFI) > 0.9; Tucker Lewis index (TLI) > 0.9; root mean square error of approximation (RMSEA) < 0.06, with confidence interval p-value > 0.05; standardised root mean square residual (SRMR) < 0.08. Difference in chi-square test results are from comparing the model in question with the hypothesised model. A p-value of < 0.05 indicates a significant difference in likelihood.

The results presented in Table 4.14 that relate to the nature items show good support for hypothesis H2aN. In particular, the hypothesised factor structure showed fit indices in their appropriate ranges, and the difference in chi square tests showed that it was a significantly more likely factor structure than any of the plausible alternatives. However, the results related to the humanity items show less support for hypothesis H2aH. In particular, while the fit indices for the hypothesised factor structure are overall in their appropriate ranges, the hypothesised structure was not found to be significantly more likely than the
alternatives. The decision to keep the three POs distinct for the humanity scope, therefore, may rest more heavily on theoretical considerations than on these results.

Table 4.15

**Confirmatory factor analysis results for the humanity items, and the humanity and experience items combined**

<table>
<thead>
<tr>
<th>Model</th>
<th>Factor structure</th>
<th>χ² (df)</th>
<th>χ² p-value</th>
<th>CFI</th>
<th>TLI</th>
<th>RMSEA (90% CI)</th>
<th>RMSEA CI p-value</th>
<th>SRMR</th>
<th>Difference in χ² (p-value)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seven hypothesised factors</td>
<td>1) ExpN</td>
<td>348.45</td>
<td>&lt;0.001</td>
<td>0.91</td>
<td>0.89</td>
<td>0.06 (0.04 – 0.08)</td>
<td>0.13</td>
<td>0.08</td>
<td>NA</td>
</tr>
<tr>
<td></td>
<td>2) IntN</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>3) EssN</td>
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</tr>
<tr>
<td></td>
<td>4) ExpH</td>
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<tr>
<td></td>
<td>5) IntH</td>
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<tr>
<td></td>
<td>6) EssH</td>
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<td></td>
<td>7) Experience</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Three factors</td>
<td>1) ExpIntEssN</td>
<td>447.12</td>
<td>&lt;0.001</td>
<td>0.84</td>
<td>0.82</td>
<td>0.08 (0.07 – 0.09)</td>
<td>&lt;0.001</td>
<td>0.09</td>
<td>98.67 (&lt;0.001)</td>
</tr>
<tr>
<td></td>
<td>2) ExpIntEssH</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td></td>
<td>3) Experience</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Two factors A</td>
<td>1) ExpIntEssN and Experience</td>
<td>566.09</td>
<td>&lt;0.001</td>
<td>0.72</td>
<td>0.70</td>
<td>0.10 (0.09 – 0.11)</td>
<td>&lt;0.001</td>
<td>0.11</td>
<td>250.64 (&lt;0.001)</td>
</tr>
<tr>
<td></td>
<td>2) ExpIntEssH</td>
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<td></td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>Two factors B</td>
<td>1) ExpIntEssN</td>
<td>668.21</td>
<td>&lt;0.001</td>
<td>0.63</td>
<td>0.59</td>
<td>0.12 (0.11 – 0.13)</td>
<td>&lt;0.001</td>
<td>0.11</td>
<td>319.76 (&lt;0.001)</td>
</tr>
<tr>
<td></td>
<td>2) ExpIntEssH and Experience</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Two factors C</td>
<td>1) All nature and humanity items</td>
<td>520.49</td>
<td>&lt;0.001</td>
<td>0.77</td>
<td>0.75</td>
<td>0.09 (0.08 – 0.11)</td>
<td>&lt;0.001</td>
<td>0.09</td>
<td>172.04 (&lt;0.001)</td>
</tr>
<tr>
<td></td>
<td>2) Experience</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>One factor</td>
<td>1) All items</td>
<td>1351.0</td>
<td>&lt;0.001</td>
<td>0.62</td>
<td>0.58</td>
<td>0.12 (0.11 – 0.13)</td>
<td>&lt;0.001</td>
<td>0.11</td>
<td>1002.60 (&lt;0.001)</td>
</tr>
</tbody>
</table>

**Note.** The hypothesised factor structure and the plausible alternatives are presented in the two left-most columns. Exp = expansion; Int = interdependence; Ess = essential; N/H as suffix = nature/humanity scope. A good fit is indicated by chi-square (χ²) p-values of > 0.05; Confirmatory Fit index (CFI) > 0.9; Tucker Lewis index (TLI) > 0.9; root mean square error of approximation (RMSEA) < 0.06, with confidence interval p-value > 0.05; standardised root mean square residual (SRMR) < 0.08. Difference in chi-square test results are from comparing the model in question with the hypothesised model. A p-value of < 0.05 indicates a significant difference in likelihood.

The results in Table 4.15, in which all nature, humanity, and experience items were combined, show good support for hypothesis H2aNHE. The hypothesised seven-factor structure had adequate support across the fit indices. The TLI was only just under 0.9, but the CFI was over 0.9. The RMSEA was 0.06 and the SRMR was 0.08. In addition, the difference
in chi-square test found that this model was significantly more likely than the alternatives. This suggests that the three POs represent three distinct constructs for both nature and humanity, with general oneness experiences representing another distinct construct.

Table 4.16 displays the factor loadings for this large, seven-factor model for all items. These results confirm high standardised factor loadings for each item on its respective factor, with the exception of three items: ExpH3, IntH3, and EssH1.

Table 4.16

<table>
<thead>
<tr>
<th>Item</th>
<th>ExpN</th>
<th>IntN</th>
<th>EssN</th>
<th>ExpH</th>
<th>IntH</th>
<th>EssH</th>
<th>Experience</th>
</tr>
</thead>
<tbody>
<tr>
<td>ExpN1. My &quot;self&quot; is extended into the natural world</td>
<td>0.88</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ExpN2. Nature is a part of myself</td>
<td>0.81</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>ExpN3. If part of the natural world was destroyed, I would have lost a part of myself</td>
<td>0.73</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IntN1. The natural world is an interacting community to which I belong</td>
<td></td>
<td>0.70</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IntN2. My actions affect the natural world, and the natural world affects me</td>
<td></td>
<td>0.73</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IntN3. Nature is one big ecosystem, of which I am a part</td>
<td></td>
<td>0.76</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EssN2. There is a unifying force in the universe which brings everything together into one great whole</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.69</td>
</tr>
<tr>
<td>EssN3. A vital thread of life joins all beings on earth</td>
<td></td>
<td>0.76</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EssN5. All of existence is part of a single, unfolding reality</td>
<td></td>
<td>0.52</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EssN6. All inhabitants of Earth, human and non-human, share a common 'life-force'</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.69</td>
</tr>
<tr>
<td>ExpH1. The human community is part of myself</td>
<td></td>
<td></td>
<td></td>
<td>0.85</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ExpH2. I am extended into the human community</td>
<td></td>
<td></td>
<td></td>
<td>0.86</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ExpH3. Other people's suffering is my suffering</td>
<td></td>
<td></td>
<td></td>
<td>0.38</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IntH1. All of humanity is an interacting community to which I belong</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.91</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IntH2. I am part of a large network of all people on earth</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.95</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IntH3. All humans depend on each other</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.25</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EssH1. People share a common humanity</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.42</td>
</tr>
<tr>
<td>EssH2. Humans share something essential with each other</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.66</td>
</tr>
<tr>
<td>EssH3. On a deep level, all people share a common bond</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.84</td>
</tr>
</tbody>
</table>

Experience prefix: "I have had an experience in which...

<table>
<thead>
<tr>
<th>Experience</th>
<th>ExpN</th>
<th>IntN</th>
<th>EssN</th>
<th>ExpH</th>
<th>IntH</th>
<th>EssH</th>
<th>Experience</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experience1. My sense of separate identity seemed to dissolve into something larger than itself</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.76</td>
</tr>
<tr>
<td>Experience2. I seemed to be deeply connected to everything</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.65</td>
</tr>
<tr>
<td>Experience3. I felt everything in the world to be part of the same whole</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.70</td>
</tr>
<tr>
<td>Experience5. I seemed to go beyond my normal everyday sense of self</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.81</td>
</tr>
<tr>
<td>Experience6. I realised the oneness of myself with all things</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.83</td>
</tr>
<tr>
<td>Experience7. I felt myself to be absorbed as one with all things</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.81</td>
</tr>
</tbody>
</table>

Note. ExpN = expansion nature; IntN = interdependence nature; EssN = essential nature; ExpH = expansion humanity; IntH = interdependence humanity; EssH = essential humanity.
**Hypothesis H2b**

To test whether the different POs were differentially related to ProTs, they were all included in a correlation matrix with two of Schultz’s (2001) three types of environmental concern (see Table 4.17).

Table 4.17

*Correlation matrix, descriptive statistics, and reliability for seven oneness factors and three levels of environmental concern*

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
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<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. ExpN</td>
<td>0.84</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. IntN</td>
<td>0.62</td>
<td>0.76</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. EssN</td>
<td>0.47</td>
<td>0.51</td>
<td>0.77</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>4. ExpH</td>
<td>0.65</td>
<td>0.62</td>
<td>0.43</td>
<td>0.66</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>5. IntH</td>
<td>0.41</td>
<td>0.57</td>
<td>0.45</td>
<td>0.62</td>
<td>0.58</td>
<td></td>
<td></td>
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<tr>
<td>6. EssH</td>
<td>0.25</td>
<td>0.46</td>
<td>0.45</td>
<td>0.54</td>
<td>0.60</td>
<td>0.59</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>7. Experience</td>
<td>0.58</td>
<td>0.44</td>
<td>0.43</td>
<td>0.44</td>
<td>0.29**</td>
<td>0.27**</td>
<td>0.89</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Biospheric</td>
<td>0.38</td>
<td>0.12</td>
<td>0.02</td>
<td>0.19+</td>
<td>-0.03</td>
<td>-0.08</td>
<td>0.28**</td>
<td>0.90</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Altruistic</td>
<td>0.15</td>
<td>0.20*</td>
<td>0.07</td>
<td>0.28**</td>
<td>0.30**</td>
<td>0.23*</td>
<td>0.18+</td>
<td>0.37</td>
<td>0.85</td>
<td></td>
</tr>
<tr>
<td>10. Egoistic</td>
<td>-0.08</td>
<td>0.03</td>
<td>0.07</td>
<td>-0.02</td>
<td>0.26**</td>
<td>0.13</td>
<td>0.00</td>
<td>-0.18+</td>
<td>0.52</td>
<td>0.91</td>
</tr>
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</table>

**M**

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
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</thead>
<tbody>
<tr>
<td>4.77</td>
<td>5.58</td>
<td>4.97</td>
<td>4.92</td>
<td>5.25</td>
<td>5.42</td>
<td>4.37</td>
<td>5.68</td>
<td>5.76</td>
<td>5.13</td>
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</tbody>
</table>

**SD**

<table>
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<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.18</td>
<td>0.87</td>
<td>0.99</td>
<td>0.95</td>
<td>0.94</td>
<td>0.81</td>
<td>1.20</td>
<td>1.03</td>
<td>0.94</td>
<td>1.18</td>
</tr>
</tbody>
</table>

**Note.** M = mean; SD = standard deviation; ExpN = expansion nature; IntN = interdependence nature; EssN = essential nature; ExpH = expansion humanity; IntH = interdependence humanity; EssH = essential humanity; Experience = general oneness experiences; Biospheric = biospheric concern; Altruistic = altruistic concern; Egoistic = egoistic concern; correlations are Pearson correlation coefficients; +p < 0.1, *p < 0.05, **p < 0.01, ***p < 0.001, values in bold are Cronbach’s alphas, of which a score greater than 0.7 indicates good internal reliability.

The results in Table 4.17 partially confirmed H2b. It was predicted that, for the nature scope, *expansion* and *essential* would correlate with only biospheric concern, while *interdependence* would correlate with altruistic and egoistic concern. All were confirmed with two exceptions: *essential* did not correlate with biospheric concern, and *interdependence* did not correlate with egoistic concern. Regarding the humanity scope, it was predicted that only *expansion* and *essential* would correlate with altruistic concern. However, all three POs correlated with altruistic concern. While the humanity result is not entirely consistent with the
hypothesis, it is consistent with the three POs lacking clear distinctiveness in the factory analyses for the humanity scope. However, it is worth noting that the correlations between the three POs for humanity are small enough to support their being kept distinct.

The Cronbach’s alphas in bold along the diagonal suggest adequate internal consistency for experience and for the three POs for nature, but not for the three POs for humanity. The reliability analyses suggested that removing the humanity items with low factor loadings (see Table 4.16) would improve the reliability of the scales. However, because this would result in subscales of only two items each, Spearman-Brown split-half reliability analyses were run using the multicon package in R, and using 5000 random draws. The results of these Spearman-Brown split half reliability analyses found a reliability of 0.82 for ExpH; 0.73 for IntH; and 0.69 for EssH. With these shortened scales, ExpH and IntH show adequate reliability above 0.7, and EssH shows a reliability of just below 0.7. Re-running the CFAs from Tables 4.14 and 4.15, and the correlations from Table 4.17, with these adjusted PO subscales for the humanity scope found similar results as those presented above. However, these adjusted subscales are only two items each. Until more work is done to develop the humanity subscales further, future research that uses these scales will have to choose between shorter scales with greater reliability, and slightly longer scales with lower reliability.

In addition, the correlations between subscales are generally significant but not unreasonably strong, and the correlations between the POs are stronger within scope than across scope. Finally, experience correlated with all three POs for both the nature and humanity scopes. However, the correlations with experience tended to be stronger for the nature scope than for the humanity scope, suggesting that oneness experiences may be more closely linked to beliefs/feelings about oneness with nature than to beliefs/feelings about oneness with humanity.

Finally, given the relatively small sample size used in Study 2 (n = 102), a power analysis was conducted following Muthén & Muthén’s (2002) method for determining adequate sample size in structural equation models. The package simsem was used in R to generate 10,000 monte carlo simulations based on the CFA for the most complex model tested (i.e., the one in Table 4.17). All four criteria outlined in Muthén & Muthén’s (2002) article were satisfied. Namely, 1) biases did not exceed 10% anywhere in the model, 2) nor did they exceed 5% for any of the factor loadings, 3) coverage values were all between 0.91
and 0.98, and 4) all factor loadings showed an acceptable power of greater than 0.8, with the exception of IntH3, which showed a power of 0.65. The power values can be interpreted such that, for example, IntH3 (the only item that displayed insufficient power) loaded significantly onto the IntH factor in 65% of the 10,000 simulations. These results suggest that the sample size is adequate to be confident in the conclusions drawn overall. However, the one anomalous humanity item supports the idea that the humanity subscales need further development.

4.4.3 Discussion

The purpose of Study 2 was to follow up the exploratory factor analysis employed in Study 1 with a confirmatory factor analysis using a refined set of items. There were two general hypotheses in Study 2. The first (H2a) was that the three types of PO from the oneness typology would form three unique factors for both nature and humanity sets of items, and experience items would form another unique factor. The second (H2b) was that the three POs would be differentially related to two of Schultz’s (2001) levels of environmental concern.

The results of the confirmatory factor analyses supported H2a, which suggests that the three types of PO can be thought of as three meaningfully separate constructs when applied both to the broad scope of nature and to the broad scope of humanity. In other words, the items that were used in this study can be meaningfully arranged into three categories that reflect distinct psychological constructs. Namely, the perception of interdependence with other, the perception of sharing something essential with other, and the perception of other as part of the self (expansion), when the other in question is either the abstract entity “nature” or “humanity”. The results also suggest that general oneness experiences form a unique factor to beliefs/feelings about the nature of the connection between self and nature or humanity.

However, for the humanity items, there was only marginally better support for the distinctness of the three POs compared to collapsing them into one factor. This suggests that they can be reasonably separated or collapsed depending on theoretical considerations or the research questions of interest.

The correlation results suggested that H2b was only partially supported. That is, for nature items, expansion correlated with only biospheric concern as predicted, and
interdependence correlated with only altruistic concern as predicted. However, inconsistent with the prediction, essential did not correlate with biospheric concern. These results suggest that an interdependence PO with nature tends to correlate with instrumentally valuing the environment; an expansion PO with nature tends to correlate with intrinsically valuing the environment; while an essential PO with nature does not correlate with intrinsically valuing the environment. This is inconsistent with the idea that deep environmental values stem from a sense of shared essence with nature (e.g., Dutcher et al., 2007) and is instead consistent with the idea that intrinsically valuing others comes from including them in the self (e.g., Cialdini et al., 1997).

Regarding the humanity items, all three correlated with altruistic concern. However, it was predicted that only expansion and essential would, because altruistic concern was taken as a proxy measure of intrinsically valuing the environment. The logic was that if one values the environment for humanity’s sake, then humanity is the end goal in that motivational strand. However, this is a less direct measure of intrinsically valuing humanity than biospheric concern is a measure of intrinsically valuing nature. Perhaps something equivalent to biospheric concern but within the humanity domain would have been a more appropriate measure. Nonetheless, the failure for the three POs to differentially relate to altruistic concern is consistent with the finding from H2a that they tend to collapse into one factor.

Finally, the significant positive correlations between experience and all three POs for both the nature and humanity scopes support the hypothesis that general oneness experiences can create or reinforce beliefs/feelings about all three POs. However, the stronger correlations between experience and nature, compared to experience and humanity, suggest that oneness experiences may be more closely linked to beliefs/feelings about oneness with nature than to beliefs/feelings about oneness with humanity. One potential explanation for this difference is that oneness experiences may tend to happen in nature, and therefore more likely to be associated with nature in general. Another is that oneness experiences are characterised by a dissolution of boundaries, which may predispose them to creating or supporting beliefs/feelings about oneness with larger, all-encompassing entities. Nature is less bounded and closer to an all-encompassing entity than is humanity.
4.5 General discussion and conclusion

The research outlined in this chapter was conducted to empirically test and refine the oneness typology (Chapter 3 of the current thesis), and to take the first steps towards constructing a measurement tool for future research. Study 1 explored the factor structures underlying a range of items that were constructed to distinguish between the three different types of psychological ontology (PO), namely expansion, interdependence, and essential. It explored these underlying factors in six different item pools, one for every combination of manifestation (belief, feeling, and experience) and scope (humanity and nature were the two chosen for this research).

Taking the typology at face value, each of the three POs were hypothesised to load onto their own unique factor for each of these combinations of manifestation and scope. That meant that beliefs in oneness with nature should have been able to distinguish between the three kinds of PO, as should both feelings and experiences of oneness with nature; and also that the same should hold true for the humanity scope. Study 1 provided only borderline evidence for this, with most analyses finding items from multiple POs loading onto the same factor.

The method of item generation used for Study 1 led to the construction of items that may not have been as representative of their respective PO as intended. Further, key words like “family”, “related”, and “kinship” were used that may not have specifically isolated the intended PO. Study 2 refined the item-set to reflect these issues and improve the face validity. In addition, in between Studies 1 and 2, oneness experiences were reconceptualised such that they are not likely to discriminate between the three POs, and that their “ineffability” (MacLean et al., 2012) enables them to create or reinforce any of the three POs depending on how they are interpreted. Further, the belief and feeling manifestations were redefined operationally as one belief/feeling manifestation using the prefix “I feel that”. This enabled Study 2 to focus on the distinctiveness of the three POs, rather than also trying to support the relatively subtle distinction between beliefs and feelings by simply changing the prefix of self-report items. As such, Study 2 used confirmatory factor analysis on a new group of participants, seeking to support the distinctiveness of the three POs for the combined belief/feeling manifestation, and the distinctiveness of oneness experiences from oneness beliefs/feelings, using the two scopes of nature and humanity.
A high level of support was found for the hypotheses in Study 2, which suggests that the three POs can be meaningfully conceptualised as three distinct constructs. More specifically, the perception of interdependence with nature, the perception of a shared essence with nature, and the perception of nature as part of the self are three unique kinds of connection that can be perceived to exist between self and nature. The results were not as strong for the humanity scope, given that there was a similar level of support for the three POs collapsing into one factor compared to three separate factors.

The distinctiveness of the three POs has implications for pre-existing measures that refer to multiple types of PO among their items. In particular, the type of oneness measured in a given study may be of a broader nature than a researcher might intend, or may be predominately of a different specific type of oneness than would be theoretically appropriate. Whether or not these three different POs have differential effects on other psychological phenomena is an area for future research.

Another result from Study 2 was that there was good support for oneness experiences forming a separate factor to oneness beliefs/feelings. This suggests they are different constructs. Despite forming separate factors, there was a significantly positive relationship between general oneness experiences and each of the three POs for both nature and humanity. This is consistent with the hypothesis that general, ineffable oneness experiences may create or reinforce all three POs, depending on how they are interpreted. These beliefs/feelings provide a mechanism by which fleeting oneness experiences may have an impact on other psychological phenomena beyond the end of the experience itself. This is an area for more detailed research in the future.

It is worth noting that feelings would seem to be, like experiences, hard to describe, and it is not clear whether someone can “feel” interdependence. However, the word feeling here is used to refer to intuitive senses rather than emotions, and one can be intuitively drawn to the proposition of interdependence without knowing enough to say they believe that it’s true. Nonetheless, operationally defining oneness beliefs and feelings into one combined manifestation circumvented this issue in Study 2.

Finally, the three POs for nature differentially related to measures of intrinsically and instrumentally valuing the environment. Although this was in a slightly different pattern to the one hypothesised, it nonetheless suggests that the different POs have different practical consequences. The finding that essential did not correlate with intrinsically valuing the
environment was surprising, and may require future research to understand in more depth. One possibility is that a shared essence carries spiritual connotations, and spirituality may not consistently predict ProTs (Dillon et al., 2003; Oh & Sarkisian, 2011).

Regarding humanity, all three POs correlated with the measure of intrinsically valuing humanity, which was inconsistent with the hypothesis, but consistent with the tendency for them to collapse into one factor. However, essential was only borderline significant, which lends support to the idea that more spiritual, shared essence POs might be less conducive to ProTs.

Although the items used in Study 2 form a set of scales and subscales that are argued to be useful, interesting, and supported by the research presented here, there are a number of limitations that require addressing. One is that the lengths of most of the subscales in Study 2 were relatively short. With the exceptions of the essential subscale for nature, and the general experience subscale, all other subscales were only three items in length. If one was to improve the lower reliability of the humanity subscales by deleting problematic items, the three PO subscales for humanity would be even shorter at only two items each. Future research would benefit from adding more items to each subscale, assuming they adequately isolate the intended PO. The appropriate wording of additional items might depend on the cultural background of the participants. Culturally specific metaphors and symbols that capture a given PO could be particularly useful. Cross cultural considerations are discussed in depth in Chapter 6.

Nonetheless, despite the short scales, the support for each PO forming a unique factor suggests that future research should expect to find similar factors, assuming any additional items validly reflect the intended PO. If future research is interested in general oneness consisting of all three POs, combining all subscales for a given scope would produce a sufficiently long scale. In such a case, items with more general key words could be reincorporated (e.g., “oneness”, “related”, and “kinship”).

Another limitation is that the current research focussed only on the two abstract, large-scale scopes (humanity and nature). Future research ought to tailor the items to the appropriate scope. For example, if one is interested in a particular kind of PO with a specific part of nature (e.g., a local forest) or a specific social group (e.g., a local neighbourhood), then the items could be re-written to reflect interdependence with, sharing an essence with, and expansion to include that forest or neighbourhood. It might be revealed that some scopes
lend themselves more readily to particular psychological ontologies over others, which would demand further adjustments to the oneness typology. For example, oneness may tend to extend most easily to specific close others (e.g., offspring or partners) and boundless, all-encompassing entities, in line with the boundlessness of oneness experiences.

Despite these limitations, the research presented here provides a set of subscales for each PO for both humanity and nature that can be used in future research. The results suggest that each subscale can be treated as a meaningfully distinct construct. The research also provides a subscale for oneness experiences, which can be treated as a distinct construct, possibly antecedent to oneness beliefs/feelings about any of the three POs. This research was partly justified by the observed conflation of concepts in pre-existing oneness measures (see Chapter 3 of the current thesis). Although the factor analysis results support this argument, whether or not this is a problem for specific relationships between oneness and other psychological phenomena depends on whether the different types of oneness actually affect other psychological phenomenon in different ways. Preliminary evidence was found here for the differential effects of the three POs on biospheric and altruistic concern, particularly for the nature scope. Future research can use the scales developed here to explore further the differential effects of the three POs and general oneness experiences on these and other prosocial and pro-environmental tendencies.
Chapter 5

The Differential Effects of Psychological Ontology on ProTs, With Oneness Experiences as a Common Starting Point

Overview

The many and varied oneness concepts have consistently been found to predict various measures of prosocial and pro-environmental tendencies (ProTs). However, it is not clear exactly what types of oneness connections are doing the work in this relationship. The research presented in the current chapter tested for the differential effects of three psychological ontologies (POs; expansion, essential, and interdependence) on ProTs. It also tested for the possibility that general oneness experiences can create or reinforce beliefs/feelings about these POs, representing a mechanism by which oneness experiences can influence ProTs beyond the end of the experience itself. These relationships were tested within the two broad scopes of nature and humanity. The results suggest that, for the nature scope, expansion predicts pro-environmental behaviour through biospheric concern (a measure of intrinsically valuing nature); and interdependence predicts altruistic concern (a measure of instrumentally valuing nature) and directly predicts pro-environmental behaviour without going through altruistic concern. Moreover, expansion (in series with biospheric concern) and interdependence (on its own) both mediated the relationship between experiences and pro-environmental behaviour. These results add nuance to the understanding of the relationship between oneness and ProTs. The results also suggest that oneness experiences are useful for creating or reinforcing oneness beliefs/feelings that go on to influence ProTs, particularly when interpreted using language and metaphors that relate to expansion and interdependence POs. The results from the humanity scope confirmed the trend in the literature but did not add nuance to it. That is, distinguishing between the three POs had no implications for prosocial tendencies, and oneness experiences did not have an indirect effect on ProTs through beliefs/feelings about oneness with humanity. The implications of these results are discussed, and areas for future research are identified, with an emphasis on the importance of future cross-cultural research.
5.1 Introduction

Broadly speaking, oneness is a sense that the self is profoundly connected to other entities, particularly larger ones like nature and humanity. The general positive relationship between various oneness concepts and prosocial and pro-environmental tendencies (ProTs) is well established in the literature (e.g., Arnocky et al., 2007; Cialdini et al., 1997; A. C. Davis & Stroink, 2016; J. L. Davis et al., 2009; Dutcher et al., 2007; Mashek et al., 2007; Mayer & Frantz, 2004; Stroink & DeCicco, 2011; Weinstein et al., 2009). However, this general relationship is based on measures of oneness that do not systematically distinguish between potentially important different types of oneness. Are there particular kinds of oneness connection that are more important than others? And if multiple kinds are important, are they important in different ways?

The first step in answering this question is to identify distinct types of oneness. In Chapter 3 of the current thesis, I proposed a oneness typology that was based on the language used to describe and measure the various oneness concepts already in the literature. The typology presented the following three ways of conceptualising exactly what counts as a oneness connection (i.e., three psychological ontologies or POs): 1) interdependence (self as an integral part of a larger, symbiotic system); 2) essential (self and other as sharing some essential property or substance); and 3) expansion (other as part of the self). The typology also contained a manifestation dimension, which accounts for the possibility that information related to the PO can be manifested in an experience, belief, or feeling/intuition. Finally, the typology had a scope dimension, which accounts for oneness concepts applying to entities at a range of different scales, from individual people, to social groups, and larger, more abstract concepts like humanity, nature, or even all of existence. These three dimensions of the typology (PO, manifestation, and scope) allowed for a more thorough theoretical definition of oneness. That is, oneness is a psychological phenomenon in which one believes, feels, or experiences a sense that the self is interdependent with the other, shares an essence with the other, or includes the other, where the other can be an entity at a variety of different scales.

After further theorising, which was partly informed by the results of factor analyses in Chapter 4 of the current thesis, the experience manifestation was no longer thought to distinguish between the three POs. Oneness experiences were instead reconceptualised to reflect more general, ineffable experiences of profound connection to self-transcendent entities. The belief and feeling manifestations were still thought to distinguish between the three POs, but after further theorising and reflecting on the results of Chapter 4, they became
operationally defined as a single belief/feeling manifestation. The result was four types of oneness: 1) general oneness experiences, and 2-4) beliefs/feelings relating to the three POs. The main aims of the present research are 1) to test for the differential effects of beliefs/feelings about the three POs on ProTs, and 2) to test for the possibility that oneness experiences create or reinforce these beliefs/feelings, thereby providing a mechanism through which fleeting oneness experiences can influence ProTs beyond the end of the experience itself. These two aims are explored in the context of two scopes, namely nature and humanity. These two scopes are appropriately broad to be consistent with the broad ProTs of interest to the present thesis, and they also reflect a distinction that already appears in the oneness literature (e.g., Leary et al., 2008; Mayer & Frantz, 2004; McFarland et al., 2013).

5.1.1 Three POs differentially affect ProTs

Much of the literature on which the typology was based also alluded to the different ways that the three POs might relate to ProTs. There were three themes that seemed to capture the variation in how the POs might relate to ProTs: 1) oneness creates ProTs because, under conditions of oneness, harm to other is perceived as harm to self, so the drive to protect the self is extended by definition to the included other (e.g., Cialdini et al., 1997; Naess & Drengson, 2008; Nisbet et al., 2009; Schultz, 2001); 2) Environmental values stem from the kind of material interdependence referred to by Aldo Leopold (1970), because we will strive to protect the interacting system of which we perceive ourselves to be a part and on which we perceive our welfare to depend (e.g., Mayer & Frantz, 2004; Perkins, 2010; Schultz, 2002; Tam, 2013); 3) Environmental values stem not from interdependence but from a sense of shared essence with nature, because as Dutcher et al. (2007, p. 478) put it, “people who sense a fundamental sameness between themselves and the natural world (as well as to other people) will feel more empathetic and compassionate towards nature”. Each of these arguments relates to a different PO. That is, 1) relates to expansion, 2) relates to interdependence, and 3) relates to essential. Although these three arguments are based more-so on the oneness with nature literature than on the oneness with humanity literature, the logic applies to both scopes.

These recurring themes suggest that all three POs should predict a tendency to want to protect nature or humanity. However, given the stark differences of the three POs at face value, they appear prone to producing this tendency through different paths. The distinction
between intrinsically valuing (valuing something as an end in itself) and instrumentally valuing (valuing something as a means to an end) is one way to conceptualise the different paths through which the three POs might affect helpful tendencies. In particular, expansion is hypothesised to predict intrinsically valuing the other, because if the self is intrinsically valued, then anything included in the self is also intrinsically valued by extension. Essential is also hypothesised to predict intrinsically valuing the other, because if we are fundamentally the same, then whatever imbues me with intrinsic value also imbues you with intrinsic value. Finally, interdependence is hypothesised to predict instrumentally valuing the other, because if we are in a symbiotic system together, then your welfare is valued because of the indirect consequences to the self if part of the system is harmed. With this background in mind, the first two general hypotheses are as follows:

H1a) All three POs uniquely predict the ProT behaviours or aspirations.

H1b) The three POs predict these ProT behaviours or aspirations through different paths. Namely, expansion and essential go through intrinsically valuing the other, and interdependence goes through instrumentally valuing the other.

The more specific hypotheses relating to the measures being used, and tailored to each of the two scopes (nature and humanity) are outlined after the methods section.

5.1.2 Oneness experiences create or reinforce all three POs, thereby exerting a more stable influence on ProTs

Oneness experiences are transient, powerful feelings of unity with self-transcendent entities. They have been described and measured under the various labels, including mystical experiences (Hood, 1975; MacLean et al., 2012), spiritual experiences (MacDonald, 2000a; MacDonald, 2000b); and they may be closely related to awe experiences (Yaden et al., 2017). These kinds of experiences have been found to predict ProTs (Griffiths et al., 2006; Griffiths et al., 2008; Huber & MacDonald, 2012) and other positive outcomes, even up to 14 months after the event (Griffiths et al., 2011; Griffiths et al., 2018). What is the mechanism by which the experience is carried forward? The proposition made by the present research is that
oneness experiences may interact with existing belief structures to shape specific oneness beliefs/feelings, which then go on to influence ProTs in a more stable manner.

This proposition is supported indirectly by the literature. For example, one of the characteristics of mystical experiences is that they are ineffable (Hood, 1975; MacLean et al., 2012). The combination of their ineffability and their tendency to be ‘boundary dissolving’ leave them open to being interpreted in ways that are consistent with beliefs/feelings about all three POs. Further, Van Cappellen and Saroglou (Van Cappellen & Saroglou, 2012) found that pre-existing spiritual beliefs and “universal” values influenced how awe experiences were interpreted, suggesting that oneness-type experiences can be interpreted in different ways based on different pre-existing perspectives and knowledge. Similarly, Yaden et al. (2017) noted that how one interprets self-transcendent experiences in light of their existing knowledge structures may influence their downstream effects, suggesting that different interpretations of oneness-type experiences can have effects on outcomes beyond the end of the experience itself. Finally, the Oneness Beliefs scale (Garfield et al., 2014) contains two subscales, one for physical oneness beliefs and one for spiritual oneness beliefs, both of which reflect different perspectives on the nature of reality, and were designed to reflect more stable, belief-based effects of transient oneness experiences.

If experiences are interpreted using an individual’s salient language, metaphors and knowledge, it is theoretically possible for oneness experiences to create or bolster any of the three kinds of PO. If so, and if hypotheses H1a and H1b are true, then beliefs/feelings about the three POs represent a longer lasting mechanism by which general oneness experiences can influence ProTs beyond the end of the experience itself. This creates the last two general hypotheses for the research in this chapter.

H2a) Experiences predicts beliefs/feelings about all three POs

H2b) Beliefs/feelings about the POs mediate the relationship between experiences and ProTs

The more specific hypotheses relating to the measures being used, and tailored to each of the two scopes (nature and humanity), are outlined after the methods section.
5.2 Method

Participants

The participants were 102 undergraduate psychology students at the University of Auckland, with an age range of 18 – 47, mean of 21.1, median of 20, and mode of 20. 73 identified as female, 27 as male, 2 as other (non-binary or not specified). Participants voluntarily took part in the survey for course credit. They were the same participants as those in Chapter 4. The research was approved by the University of Auckland Human Participants Ethics Committee. Given the smaller sample size in this study, the statistical power for each analysis may not always reach the 0.8 level recommended by Cohen (1992). Sensitivity analyses were run using the power calculator “G*Power” (Faul et al., 2007), which found that the range of analyses run in this study required only small effect sizes of Cohen’s $f^2$ (0.11 < $f^2$ < 0.14) (Selya et al., 2012).

Measures

The study used an online questionnaire with the following measures.

Beliefs/feelings about POs for nature and humanity

The present study used three measures of oneness with nature, and three measures of oneness with humanity (see Table 5.1). All come from Chapter 4 of the current thesis, which statistically distinguished between the three kinds psychological ontology (PO) outlined in the oneness typology in Chapter 3 of the current thesis. The shorter, two-item versions of the humanity subscales were chosen for their higher reliability. The items all had the prefix “I feel that…”, and were measured on a 7-point Likert scale from strongly disagree (1) to strongly agree (7).
Table 5.1

Scales used to measure beliefs/feelings about the three psychological ontologies for nature and humanity in this study

<table>
<thead>
<tr>
<th>Item number</th>
<th>Expansion nature</th>
<th>Interdependence nature</th>
<th>Essential nature</th>
<th>Expansion humanity</th>
<th>Interdependence humanity</th>
<th>Essential humanity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>My “self” is extended into the natural world</td>
<td>The natural world is an interacting community to which I belong</td>
<td>There is a unifying force in the universe which brings everything together into one great whole</td>
<td>The human community is part of myself</td>
<td>All of humanity is an interacting community to which I belong</td>
<td>Humans share something essential with each other</td>
</tr>
<tr>
<td>2</td>
<td>Nature is a part of myself</td>
<td>My actions affect the natural world, and the natural world affects me</td>
<td>A vital thread of life joins all beings on earth</td>
<td>I am extended into the human community</td>
<td>I am part of a large network of all people on earth</td>
<td>On a deep level, all people share a common bond</td>
</tr>
<tr>
<td>3</td>
<td>If part of the natural world was destroyed, I would have lost a part of myself</td>
<td>Nature is one big ecosystem, of which I am a part</td>
<td>All of existence is part of a single, unfolding reality</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>All inhabitants of Earth, human and non-human, share a common “life-force”</td>
</tr>
</tbody>
</table>

M | 4.77 | 5.58 | 4.97 | 5.04 | 5.24 | 5.50 |
SD | 1.18 | 0.87 | 0.99 | 1.06 | 1.09 | 0.90 |
Reliability | 0.84 | 0.76 | 0.77 | 0.82 | 0.73 | 0.69 |

Note. Scored on a 7-point Likert scale from strongly disagree (1) to strongly agree (7). M = mean; SD = standard deviation; Reliability = Cronbach’s alpha for scales with more than two items, Spearman-Brown’s split half for scales with two items, of which a score greater than 0.7 indicates good internal reliability.

Oneness Experience

The measure of oneness experiences used here was the one that was confirmed in Chapter 4 to form a separate factor from beliefs/feelings about the three POs (see Table 5.2). The items all had the prefix “I have had an experience in which…”, and were measured on a 7-point likert scale from strongly disagree (1) to strongly agree (7).
Table 5.2

Scale used to measure general oneness experiences in this study

<table>
<thead>
<tr>
<th>Item number</th>
<th>Prefix: “I have had an experience in which…”</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>My sense of separate identity seemed to dissolve into something larger than itself</td>
</tr>
<tr>
<td>2</td>
<td>I seemed to be deeply connected to everything</td>
</tr>
<tr>
<td>3</td>
<td>I felt everything in the world to be part of the same whole</td>
</tr>
<tr>
<td>4</td>
<td>I seemed to go beyond my normal everyday sense of self</td>
</tr>
<tr>
<td>5</td>
<td>I realised the oneness of myself with all things</td>
</tr>
<tr>
<td>6</td>
<td>I felt myself to be absorbed as one with all things</td>
</tr>
</tbody>
</table>

M = 4.37
SD = 1.20
Alpha = 0.89

Note. Scored on a 7-point Likert scale from strongly disagree (1) to strongly agree (7); M = mean; SD = standard deviation; Alpha = Cronbach’s alpha, of which a score of greater than 0.7 indicates good internal reliability.

Prosocial and pro-environment tendencies (ProTs)

Two levels of ProTs were used for both the nature and humanity scopes. One was a measure of a general tendency to act or aspire to act in prosocial or pro-environmental ways. For the nature scope, the measure was self-reported pro-environmental behaviour. This was comprised of items taken from the Environmental Attitudes Inventory (Milfont & Duckitt, 2010). For the humanity scope, the measure consisted of the “community” items from the Intrinsic subscale of the Aspirations Index (“community aspirations”) (Kasser & Ryan, 1993; Kasser & Ryan, 1996). See Table 5.3 for both of these measures. Although community aspirations are not equivalent to self-reported prosocial behaviour, they are theoretically downstream to oneness and how the other entity is valued. They have also been used in a similar context, i.e., as part of the outcome of a path model in which inclusion of nature in the self mediated between immersion in nature and community and relationship aspirations (Weinstein et al., 2009). Nonetheless, future research would benefit from including more similar measures of ProTs in order to make more confident comparisons between the nature and humanity scopes. However, the differences between the two measures of ProTs do undermine the ability to test whether different types of oneness differentially affect a given measure of ProTs within either scope.
Table 5.3

Measures of prosocial and pro-environmental tendencies used in this study

<table>
<thead>
<tr>
<th></th>
<th>Environmental concern</th>
<th>Pro-environmental behaviour</th>
<th>Community aspirations</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Biospheric</td>
<td>Egoistic</td>
<td>Altruistic</td>
</tr>
<tr>
<td>1 Plants</td>
<td>Me</td>
<td>People in the community</td>
<td>Whenever possible, I try to conserve water</td>
</tr>
<tr>
<td>2 Marine life</td>
<td>My lifestyle</td>
<td>Humanity</td>
<td>I always switch the light off when I don’t need it anymore</td>
</tr>
<tr>
<td>3 Birds</td>
<td>My health</td>
<td>Children</td>
<td>I always switch the light off when I don’t need it anymore</td>
</tr>
<tr>
<td>4 Animals</td>
<td>My future</td>
<td>Future Generations</td>
<td>I drive whenever it suits me, even if it does pollute the atmosphere (REVERSE)</td>
</tr>
<tr>
<td>5</td>
<td>I support an environmental organization</td>
<td>Whenever possible, I make a special effort to purchase products that are environmentally friendly</td>
<td>It is important to help people in need</td>
</tr>
<tr>
<td>6</td>
<td>I try to minimize the amount of plastic waste I produce</td>
<td>Whenever possible I try to minimize my negative impact on the earth</td>
<td>It is important to help people in need</td>
</tr>
<tr>
<td>8</td>
<td>Whenever possible I try to minimize my negative impact on the earth</td>
<td>Whenever possible I try to minimize my negative impact on animals</td>
<td>It is important to help people in need</td>
</tr>
</tbody>
</table>

Note. Pro-environmental behaviour and community aspirations scored on a 7-point Likert scale from strongly disagree (1) to strongly agree (7); environmental concern scored on a 7-point Likert scale in response to being asked “please rate the following items from 1 (not important) to 7 (supreme importance) in response to the question: I am concerned about environmental problems because of the consequences for...”. Environmental concern taken from Schultz (2001); Pro-environmental behaviour adapted from Milfont and Duckitt (2010); community aspirations items taken from the Aspirations Index (Kasser & Ryan, 1993; Kasser & Ryan, 1996). M = mean; SD = standard deviation; Alpha = Cronbach’s alpha, of which a score greater than 0.7 indicates good internal reliability.

While it was hypothesised that all types of oneness would predict these two general tendencies in their respective scopes (pro-environmental behaviour and community aspirations), it was also hypothesised that they would do so through different paths. The different paths considered here were intrinsically and instrumentally valuing the other. Variation in intrinsically and instrumentally valuing nature and humanity was measured using
Schultz’s (2001) three levels of environmental concern – biospheric, altruistic, and egoistic. Biospheric concern is characterised by being concerned about environmental damage because of its effects on natural entities like plants and animals. Biospheric concern is therefore characterised by valuing nature for the sake of nature itself (i.e., intrinsically valuing nature). Altruistic concern is characterised by being concerned about environmental damage because of its effects on other people, and is therefore a measure of instrumentally valuing nature (valuing nature as a means of supporting the welfare of other people). Altruistic concern is also a measure of intrinsically valuing the wider human community, because it places people as the ultimate goal (and therefore intrinsically valued goal) of environmental protection. Finally, egoistic concern is characterised by being concerned about environmental damage because of its effects to the self, and is therefore another measure of instrumentally valuing nature. See Table 5.3 for the measures relating to these three levels of environmental concern. A measure of instrumentally valuing the wider human community was not included, meaning the humanity analyses were not as thorough as the nature ones. This was an oversight, and is an area for future research.

Socially desirable responding and affect

Given that higher levels of pro-environmental behaviour and community aspirations are likely to be interpreted as socially desirable, these measures are prone to eliciting inflated responses from some participants (Paulhus & Reid, 1991). To control for socially desirable responding, the eight Impression Management items from the Balanced Inventory of Desirable Responding Short Form (BIDR-16: Hart, Ritchie, Hepper, & Gebauer, 2015; Paulhus, 1988) was also included, using the continuous method of scoring (Stöber, Dette, & Musch, 2002). Similarly, positive moods can increase the tendency for people to respond in ways that they perceive to be expected by or consistent with others (Hertel, Neuhof, Theuer, & Kerr, 2000). To control for these possible effects, a 5-point affect scale with a “smiley face” that ranges from frown to neutral to smile was used.

Procedure

The survey was created through the online questionnaire service Qualtrics and distributed online amongst an array of other potential studies in which students could participate for course credit. Students who chose to participate in this study followed a link
that took them to the survey. The first page of the survey presented a participant information sheet, which emphasised that the survey was completely anonymous, and that they could stop at any time. However, to receive their course credit they were required to complete the survey. They could withdraw and choose a different study if they chose.

After consenting to their data being used for research purposes, they were presented with four blocks of questions. The relevant instructions were presented at the start of each block. The first block contained all of the oneness items, for both nature and humanity. The second block contained all of the experience items. These first two blocks were separated so that the prefix “I feel that…” could appear at the top of the page of oneness items, and the prefix “I have had an experience in which…” could be presented at the top of the page of the experience questions. The third block contained the community aspirations, pro-environmental behaviour, and the BIDR items. The final block contained the environmental concern items, because they required a specific set of instructions. All items within each block were randomized.

5.2.1 Hypotheses

The specific hypotheses stated below integrate the measures stated in the method section with the general hypotheses from the introduction.

**Nature hypotheses**

H1aN) all three POs uniquely predict pro-environmental behaviour.

H1bN) the three POs predict pro-environmental behaviour through different paths. In particular, *expansion* and *essential* go through biospheric concern, and *interdependence* goes through altruistic and egoistic concern.

H2aN) experiences predict beliefs/feelings about all three POs.

H2bN) beliefs/feelings about the three POs mediate between experiences and ProTs in line with the results from H1bN. In particular, the following paths are hypothesised.

- experiences -> *expansion* -> biospheric concern -> pro-environmental behaviour
- experiences -> *essential* -> biospheric concern -> pro-environmental behaviour
- experiences -> *interdependence* -> altruistic concern/egoistic concern -> pro-environmental behaviour

These hypotheses can be integrated into the single path model presented in Figure 5.1.

*Figure 5.1. The hypothesised path model for the nature scope. The red solid arrows represent hypothesised paths. The blue dashed arrows are included as possible direct effects that remain after accounting for the hypothesised paths. ExpN = expansion nature; EssN = essential nature; IntN = interdependence nature. Biospheric, Altruistic, and Egoistic = the three levels of Schultz’s (2001) Environmental Concern scale.*

The red solid arrows represent the hypotheses, and the blue dashed arrows represent the direct effects that will be calculated in the wider model to explore these relationships more fully. For example, experiences might have a direct effect on pro-environmental behaviour in the path model, which would suggest that the three *POs* and three types of environmental concern do not fully mediate the relationship between experiences and pro-environmental behaviour. Conversely, if there is no direct effect experiences, but the hypothesised indirect effects are significant, this would suggest that the *POs* and
environmental concern do fully mediate the relationship between experience and pro-environmental behaviour. Failing to include this direct effect would miss this level of detail, even though there is no specific hypothesis about whether to expect a full or partial mediation. The same applies to the red solid and blue dashed arrows in the diagram for the humanity hypotheses below (Figure 5.2).

**Humanity hypotheses**

H1aH) all three POs uniquely predict community aspirations.

H1bH) the three POs predict community aspirations through different paths. In particular, *expansion* and *essential* go through altruistic concern, and *interdependence* goes directly to community aspirations.

H2aH) experiences predicts beliefs/feelings about all three POs.

H2bH) beliefs/feelings about the three POs mediate between experiences and ProTs in line with the results from H1bH. In particular, the following paths are hypothesised.

- experience -> *expansion* -> altruistic concern -> community aspirations
- experience -> *essential* -> altruistic concern -> community aspirations
- experience -> *interdependence* -> community aspirations

These hypotheses can be integrated into the single path model presented in Figure 5.2.
5.3 Results

The results are presented in two sections, one for nature and one for humanity. Each hypothesis is addressed in turn in each section. Regression results were obtained using the “glm” and “lm” functions in the statistics program R. The path analysis results were obtained using the “lavaan package” in R, with the standard errors bootstrapped across 5000 draws.

5.3.1 Nature

*Hypothesis H1aN) All three POs uniquely predict pro-environmental behaviour*

To test whether all three POs uniquely predicted pro-environmental behaviour, four multiple regression analyses were conducted. The first three kept the three POs separate, and the fourth included all three POs in a single model. All models controlled for affect and socially desirable responding.
Table 5.4

Summary of multiple regression models for the three psychological ontologies for the nature scope predicting pro-environmental behaviour (n = 102)

<table>
<thead>
<tr>
<th>Pro-environmental behaviour</th>
<th>1 ExpN</th>
<th>2 EssN</th>
<th>3 IntN</th>
<th>4 All</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Intercept)</td>
<td>2.48</td>
<td>3.39</td>
<td>2.05</td>
<td>2.37</td>
</tr>
<tr>
<td></td>
<td>***</td>
<td>***</td>
<td>**</td>
<td>***</td>
</tr>
<tr>
<td>ExpN</td>
<td>0.26</td>
<td>0.01</td>
<td>0.05</td>
<td>0.05</td>
</tr>
<tr>
<td></td>
<td>***</td>
<td>*</td>
<td>***</td>
<td>***</td>
</tr>
<tr>
<td>EssN</td>
<td>0.01</td>
<td>0.08</td>
<td>0.01</td>
<td>0.02</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IntN</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Affect</td>
<td>-0.01</td>
<td>0.09</td>
<td>0.04</td>
<td>0.05</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BIDR</td>
<td>0.05</td>
<td>0.01</td>
<td>0.05</td>
<td>0.05</td>
</tr>
<tr>
<td></td>
<td>***</td>
<td>***</td>
<td>***</td>
<td>***</td>
</tr>
<tr>
<td>Adj. R2</td>
<td>0.27</td>
<td>0.14</td>
<td>0.23</td>
<td>0.31</td>
</tr>
<tr>
<td></td>
<td>***</td>
<td>***</td>
<td>***</td>
<td>***</td>
</tr>
</tbody>
</table>

Note. ExpN = expansion nature; EssN = essential nature; IntN = interdependence nature; All = model including all predictors. BIDR = eight Impression Management items from the Balanced Inventory of Desirable Responding Short Form (BIDR-16: Hart et al., 2015; Paulhus, 1988). B = unstandardised regression coefficient, SE B = standard error of B, β = standardised regression coefficient, +p < 0.1, *p < 0.05, **p < 0.01, ***p < 0.001).

The results of the first three models in Table 5.4 showed that expansion and interdependence both significantly predicted pro-environmental behaviour, while essential did not. When including all three POs in one model, expansion and interdependence both uniquely predicted pro-environmental behaviour, although interdependence only had a borderline significant effect. Contrary to the hypothesis, essential negatively predicted pro-environmental behaviour when controlling for the other two POs.

**Hypothesis H1bN) The three POs affect ProTs in different ways**

To test whether the three POs differentially predict how nature is valued, four multiple regression analyses were conducted for each of Schultz’s (2001) three levels of environmental concern (see Tables 5.5-5.7). The hypotheses were that expansion and essential, but not interdependence, would uniquely predict biospheric concern; and interdependence, but not expansion or essential, would predict egoistic and altruistic concerns.
Table 5.5

Summary of multiple regression models for the three psychological ontologies for the nature scope predicting biospheric concern (n = 102)

<table>
<thead>
<tr>
<th></th>
<th>Biospheric concern (intrinsically valuing nature)</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 ExpN</td>
<td>2 EssN</td>
<td>3 IntN</td>
<td>4 All</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>SE B</td>
<td>β</td>
<td>B</td>
<td>SE B</td>
<td>β</td>
<td>B</td>
<td>SE B</td>
<td>β</td>
<td>B</td>
<td>SE B</td>
</tr>
<tr>
<td>Intercept</td>
<td>3.16</td>
<td>0.61</td>
<td>***</td>
<td>4.44</td>
<td>0.70</td>
<td>***</td>
<td>3.56</td>
<td>0.81</td>
<td>***</td>
<td>3.99</td>
<td>0.75</td>
</tr>
<tr>
<td>ExpN</td>
<td>0.32</td>
<td>0.08</td>
<td>***</td>
<td>0.44</td>
<td>0.10</td>
<td>0.51</td>
<td>0.82</td>
<td>0.11</td>
<td>0.22</td>
<td>0.23</td>
<td>0.14</td>
</tr>
<tr>
<td>EssN</td>
<td>-0.02</td>
<td>0.10</td>
<td>-0.02</td>
<td>0.12</td>
<td>0.14</td>
<td>-0.08</td>
<td>0.01</td>
<td>0.12</td>
<td>-0.06</td>
<td>0.11</td>
<td>0.14</td>
</tr>
<tr>
<td>IntN</td>
<td>-0.09</td>
<td>0.11</td>
<td>-0.07</td>
<td>-0.01</td>
<td>0.12</td>
<td>-0.01</td>
<td>-0.06</td>
<td>0.12</td>
<td>-0.05</td>
<td>-0.06</td>
<td>0.11</td>
</tr>
<tr>
<td>BIDR</td>
<td>0.04</td>
<td>0.01</td>
<td>0.29</td>
<td>0.05</td>
<td>0.01</td>
<td>0.31</td>
<td>0.05</td>
<td>0.01</td>
<td>0.31</td>
<td>0.04</td>
<td>0.01</td>
</tr>
<tr>
<td>Adj. R²</td>
<td>0.20</td>
<td>0.06</td>
<td>0.08</td>
<td>0.23</td>
<td>0.06</td>
<td>0.08</td>
<td>0.23</td>
<td>0.06</td>
<td>0.08</td>
<td>0.23</td>
<td>0.06</td>
</tr>
</tbody>
</table>

Note. ExpN = expansion nature; EssN = essential nature; IntN = interdependence nature; All = model including all predictors. BIDR = eight Impression Management items from the Balanced Inventory of Desirable Responding Short Form (BIDR-16: Hart et al., 2015; Paulhus, 1988). B = unstandardised regression coefficient, SE B = standard error of B, β = standardised regression coefficient, +p < 0.1, *p < 0.05, **p < 0.01, ***p < 0.001).

The results in Table 5.5 suggest that, consistent with the hypothesis, expansion predicted biospheric concern, while interdependence did not. This pattern was found when the POs were kept separate and when they were included in a single model. However, inconsistent with the hypothesis, essential did not predict biospheric concern when kept separate from the other POs, and it significantly negatively predicted biospheric concern when included in a model with all three POs. It is worth noting that models 2 and 3 (EssN and IntN respectively) did not reach Cohen’s (1992) recommended 0.8 power threshold with power values of 0.53 and 0.68 respectively.
Table 5.6

Summary of multiple regression models for the three psychological ontologies for the nature scope predicting altruistic concern (n = 102)

<table>
<thead>
<tr>
<th></th>
<th>1 ExpN</th>
<th></th>
<th>2 EssN</th>
<th></th>
<th>3 IntN</th>
<th></th>
<th>4 All</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>SE</td>
<td>B</td>
<td>SE</td>
<td>B</td>
<td>SE</td>
<td>B</td>
<td>SE</td>
</tr>
<tr>
<td>Intercept</td>
<td>5.21</td>
<td>0.62</td>
<td>5.40</td>
<td>0.67</td>
<td>4.46</td>
<td>0.76</td>
<td>4.54</td>
<td>0.78</td>
</tr>
<tr>
<td></td>
<td>***</td>
<td></td>
<td>***</td>
<td></td>
<td>***</td>
<td></td>
<td>***</td>
<td></td>
</tr>
<tr>
<td>ExpN</td>
<td>0.12</td>
<td>0.08</td>
<td>0.15</td>
<td></td>
<td>0.04</td>
<td>0.10</td>
<td>0.04</td>
<td></td>
</tr>
<tr>
<td>EssN</td>
<td>0.07</td>
<td>0.10</td>
<td>0.07</td>
<td></td>
<td>-0.06</td>
<td>0.11</td>
<td>-0.06</td>
<td></td>
</tr>
<tr>
<td>IntN</td>
<td></td>
<td></td>
<td>0.25</td>
<td>0.11</td>
<td>0.23</td>
<td>0.15</td>
<td>0.23</td>
<td></td>
</tr>
<tr>
<td></td>
<td>*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Affect</td>
<td>0.07</td>
<td>0.12</td>
<td>-0.06</td>
<td>-0.05</td>
<td>0.12</td>
<td>-0.05</td>
<td>-0.10</td>
<td>-0.09</td>
</tr>
<tr>
<td>BIDR</td>
<td>0.01</td>
<td>0.01</td>
<td>0.05</td>
<td>0.01</td>
<td>0.01</td>
<td>0.05</td>
<td>0.01</td>
<td>0.01</td>
</tr>
<tr>
<td>Adj. R²</td>
<td>-0.00</td>
<td></td>
<td>-0.02</td>
<td></td>
<td>0.02</td>
<td></td>
<td>0.01</td>
<td></td>
</tr>
</tbody>
</table>

Note. ExpN = expansion nature; EssN = essential nature; IntN = interdependence nature; All = model including all predictors. BIDR = eight Impression Management items from the Balanced Inventory of Desirable Responding Short Form (BIDR-16: Hart et al., 2015; Paulhus, 1988). B = unstandardised regression coefficient, SE B = standard error of B, β = standardised regression coefficient, +p < 0.1, *p < 0.05, **p < 0.01, ***p < 0.001).

The results in Table 5.6 suggest that, consistent with the hypothesis, interdependence predicted altruistic concern, while expansion and essential did not. This pattern was found when the POs were kept separate and when they were included in a single model. However, when they were included in a single model, interdependence only had a borderline significant effect on altruistic concern. It is worth noting that the effect sizes were small in these analyses, ranging from 0-0.02. The greatest power achieved was 0.19, far below the recommended 0.8 threshold recommended by Cohen (1992).
Table 5.7  
**Summary of multiple regression models for the three psychological ontologies for the nature scope predicting egoistic concern (n = 102)**

<table>
<thead>
<tr>
<th>Egocentric concern (instrumentally valuing nature)</th>
<th>1 ExpN</th>
<th>2 EssN</th>
<th>3 IntN</th>
<th>4 All</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>SE B</td>
<td>B</td>
<td>SE B</td>
<td>B</td>
</tr>
<tr>
<td>(Intercept)</td>
<td>6.54</td>
<td>0.78</td>
<td>5.83</td>
<td>0.82</td>
</tr>
<tr>
<td>ExpN</td>
<td>-0.07</td>
<td>0.10</td>
<td>-0.07</td>
<td></td>
</tr>
<tr>
<td>EssN</td>
<td>0.12</td>
<td>0.12</td>
<td>0.10</td>
<td></td>
</tr>
<tr>
<td>IntN</td>
<td></td>
<td>0.05</td>
<td>0.14</td>
<td>0.03</td>
</tr>
<tr>
<td>Affect</td>
<td>-0.04</td>
<td>0.14</td>
<td>-0.03</td>
<td>0.14</td>
</tr>
<tr>
<td>BIDR</td>
<td>-0.04</td>
<td>0.02</td>
<td>-0.21</td>
<td>-0.04</td>
</tr>
<tr>
<td>Adj. R²</td>
<td>0.02</td>
<td>0.02</td>
<td>0.02</td>
<td>0.02</td>
</tr>
</tbody>
</table>

**Note.** ExpN = expansion nature; EssN = essential nature; IntN = interdependence nature; All = model including all predictors. BIDR = eight Impression Management items from the Balanced Inventory of Desirable Responding Short Form (BIDR-16: Hart et al., 2015; Paulhus, 1988). B = unstandardised regression coefficient, SE B = standard error of B, β = standardised regression coefficient, +p < 0.1, *p < 0.05, **p < 0.01, ***p < 0.001).

The results in Table 5.7 suggest that, inconsistent with the hypothesis, *interdependence* did not predict egoistic concern, when considered on its own and with all three POs. Consistent with the hypothesis, *expansion* and *essential* also did not predict egoistic concern in any model. As in the previous analyses, it is worth noting that the effect sizes were small in these analyses, ranging from 0-0.02. The greatest power achieved was 0.19, far below the recommended 0.8 threshold recommended by Cohen (1992).

To test whether the three POs form three different pathways to pro-environmental behaviour through different types of environmental concern, the indirect effects of the relevant paths (see Table 5.8) were taken from the wider hypothesised path model displayed in Figure 5.3. The hypothesised paths were as follows:

i)  *expansion* -> biospheric concern -> pro-environmental behaviour  
ii) *essential* -> biospheric concern -> pro-environmental behaviour  
iii) *interdependence* -> egoistic concern -> pro-environmental behaviour  
iv) *interdependence* -> altruistic concern -> pro-environmental behaviour
Table 5.8

*Indirect effects from the three psychological ontologies to pro-environmental behaviour through different levels of environmental concern (n = 102)*

<table>
<thead>
<tr>
<th>Path</th>
<th>Estimate</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>ExpN -&gt; Biospheric -&gt; Behaviour</td>
<td>0.12*</td>
<td>0.04 – 0.21</td>
</tr>
<tr>
<td>EssN -&gt; Biospheric -&gt; Behaviour</td>
<td>-0.06</td>
<td>-0.14 – 0.01</td>
</tr>
<tr>
<td>IntN -&gt; Egoistic -&gt; Behaviour</td>
<td>0.00</td>
<td>-0.03 – 0.03</td>
</tr>
<tr>
<td>IntN -&gt; Altruistic -&gt; Behaviour</td>
<td>-0.04</td>
<td>-0.10 – 0.02</td>
</tr>
</tbody>
</table>

Note. ExpN = expansion nature; EssN = essential nature; IntN = interdependence nature; Behaviour = pro-environmental behaviour. All estimates controlled for affect and socially desirable responding using the eight Impression Management items from the Balanced Inventory of Desirable Responding Short Form (BIDR-16: Hart et al., 2015; Paulhus, 1988). CI = confidence interval; *p < 0.05.

The results in Table 5.8 suggest that, consistent with the hypothesis, *expansion* had a significant indirect effect on pro-environmental behaviour through biospheric concern. However, inconsistent with the hypothesis, *essential* and *interdependence* did not have indirect effects on pro-environmental behaviour through their hypothesised associated types of environmental concern. However, the larger path model (see Figure 5.3) did find a significant *direct effect of interdependence* on pro-environmental behaviour. Together, this suggests that there are two paths from oneness POs to pro-environmental behaviour: 1) *expansion* to biospheric concern to pro-environmental behaviour, and 2) *interdependence* directly to pro-environmental behaviour.

It is worth noting that the relatively small $R^2$ values for egoistic and altruistic concern in Figure 5.3 are, given the small sample size, also associated with insufficient power values (0.40 and 0.56 respectively), which increases the likelihood of incorrectly accepting the null hypothesis. All other outcome and mediator variables in the model, however, have adequate power.
Figure 5.3. Path analysis for the nature scope. ExpN = expansion; EssN = essential; IntN = interdependence. Values on straight lines represent standardised regression coefficients, controlling for affect and socially desirable responding. Values on curved lines represent Pearson’s correlation coefficients. Solid arrows represent hypothesised direct effects. +p < 0.1; *p < 0.05; **p < 0.01; ***p < 0.001 (n = 102).
**Hypothesis H2aN) Experiences predict all three POs**

To test whether general oneness experiences predicted all three POs, a multiple regression model was run for each PO, controlling for affect and socially desirable responding (Table 5.9). The results show that experiences significantly predicted all three POs, although the effect was greatest for expansion.

**Table 5.9**

*Summary of multiple regression models for experience predicting the three psychological ontologies for the nature scope (n = 102)*

<table>
<thead>
<tr>
<th></th>
<th>1 ExpN</th>
<th></th>
<th>2 EssN</th>
<th></th>
<th>3 IntN</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>SE B</td>
<td>β</td>
<td>B</td>
<td>SE B</td>
<td>β</td>
</tr>
<tr>
<td>(Intercept)</td>
<td>2.17</td>
<td>0.60</td>
<td>***</td>
<td>3.00</td>
<td>0.56</td>
<td>***</td>
</tr>
<tr>
<td>Experiences</td>
<td>0.57</td>
<td>0.08</td>
<td>0.59</td>
<td>0.34</td>
<td>0.08</td>
<td>0.42</td>
</tr>
<tr>
<td>Affect</td>
<td>0.13</td>
<td>0.12</td>
<td>0.09</td>
<td>0.10</td>
<td>0.11</td>
<td>0.09</td>
</tr>
<tr>
<td>BIDR</td>
<td>-0.01</td>
<td>0.01</td>
<td>-0.07</td>
<td>0.00</td>
<td>0.01</td>
<td>0.02</td>
</tr>
</tbody>
</table>

Adj. R² 0.33 0.17 0.22

*Note. ExpN = expansion nature; EssN = essential nature; IntN = interdependence nature; BIDR = eight Impression Management items from the Balanced Inventory of Desirable Responding Short Form (BIDR-16: Hart et al., 2015; Paulhus, 1988); B = unstandardised regression coefficient; SE B = standard error of B; β = standardised regression coefficient; +p < 0.1; *p < 0.05; **p < 0.01; ***p < 0.001.*

**Hypothesis H2bN) Beliefs/feelings mediate between experiences and ProTs**

To test whether beliefs/feelings about the three POs mediate between experiences and ProTs, the indirect effects of the relevant paths (see Table 5.10) were taken from the wider hypothesized path model (Figure 5.3). The original hypothesized paths were as follows:

i) experiences -> *expansion* -> biospheric concern -> pro-environmental behaviour

ii) experiences -> *essential* -> biospheric concern -> pro-environmental behaviour

iii) experiences -> *interdependence* -> egoistic concern -> pro-environmental behaviour

iv) experiences -> *interdependence* -> altruistic concern -> pro-environmental behaviour
The results in Table 5.10 supported one of the hypothesised paths, in particular the one from experiences to pro-environmental behaviour through expansion and biospheric concern. The other hypothesised paths were not supported by the model. This is not surprising, given the results for H1bN, which found that essential and interdependence did not have indirect effects on pro-environmental behaviour through their hypothesised associated types of environmental concern.

To explore further the idea that beliefs/feelings about the three POs are a mechanism by which transient experiences can have effects that last beyond the experience itself, the mediating role of the three POs on their respective shorter paths were also explored within the context of the wider model presented in Figure 5.3 (see Table 5.11). That is:

- experiences -> POs -> environmental concern
- experiences -> POs -> pro-environmental behaviour
Table 5.11

*Indirect effects from general oneness experiences to environmental concern or pro-environmental behaviour, through POs (n = 102)*

<table>
<thead>
<tr>
<th>Path</th>
<th>Estimate</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experiences -&gt; ExpN -&gt; Biospheric</td>
<td>0.19**</td>
<td>0.09 – 0.31</td>
</tr>
<tr>
<td>Experiences -&gt; EssN -&gt; Biospheric</td>
<td>-0.06</td>
<td>-0.16 – 0.01</td>
</tr>
<tr>
<td>Experiences -&gt; IntN -&gt; Altruistic</td>
<td>0.07+</td>
<td>-0.007 – 0.16</td>
</tr>
<tr>
<td>Experiences -&gt; IntN -&gt; Egoistic</td>
<td>0.004</td>
<td>-0.09 – 0.13</td>
</tr>
<tr>
<td>Experiences -&gt; ExpN -&gt; Behaviour</td>
<td>0.05</td>
<td>-0.06 – 0.15</td>
</tr>
<tr>
<td>Experiences -&gt; EssN -&gt; Behaviour</td>
<td>-0.05</td>
<td>-0.01 – 0.003</td>
</tr>
<tr>
<td>Experiences -&gt; IntN -&gt; Behaviour</td>
<td>0.08+</td>
<td>0.02 – 0.18</td>
</tr>
</tbody>
</table>

*Note.* ExpN = expansion nature; EssN = essential nature; IntN = interdependence nature; Behaviour = pro-environmental behaviour. All estimates controlled for affect and socially desirable responding using the eight Impression Management items from the Balanced Inventory of Desirable Responding Short Form (BIDR-16: Hart et al., 2015; Paulhus, 1988). CI = confidence interval; +p < 0.10, *p < 0.05, **p < 0.01.

The results in Table 5.11 suggest that, consistent with the hypothesis and with the previous results, *expansion* mediated between experiences and biospheric concern. Interestingly, *expansion* did not mediate on its own between experiences and pro-environmental behaviour, suggesting that its mediating role between experiences and pro-environmental behaviour requires it to be part of a serial mediation with biospheric concern as the second mediator variable.

Also consistent with the idea that POs can carry the effects of transient experiences beyond the end of the experience itself, *interdependence* mediated between experiences and pro-environmental behaviour, and borderline mediated between experiences and altruistic concern. Inconsistent with the hypothesis, *essential* did not mediate between experiences and biospheric concern, nor between experiences and pro-environmental behaviour.

Taken together, these results related to hypothesis H2bN suggest that beliefs/feelings about two POs can carry the effects of oneness experiences on ProTs beyond the end of the experience: 1) through *expansion* to biospheric concern to pro-environmental behaviour, and 2) through *interdependence* to altruistic concern (borderline), or through *interdependence* directly to pro-environmental behaviour.
Summary

Taking these results together, and in conjunction with the wider path model in Figure 5.3, a more nuanced picture of the relationship between oneness experiences, beliefs/feelings about the three POs, and two levels of ProTs can be gleaned. In particular, the three POs were found to have differential effects on ProTs. Namely, expansion predicted pro-environmental behaviour through biospheric concern; interdependence predicted altruistic concern (borderline significance), and also predicted pro-environmental behaviour (but not through altruistic concern); and essential had borderline significant negative effects on biospheric concern and on pro-environmental behaviour.

Further, experiences were found to predict beliefs/feelings about all three POs. Two of the three POs appear to be able to carry the effects of transient experiences on ProTs beyond the end of the experience itself. In particular, 1) expansion mediated between experiences and biospheric concern, and also formed a serial mediation with biospheric concern between experiences and pro-environmental behaviour, and 2) interdependence mediated between experiences and altruistic concern (borderline), and between experiences and pro-environmental behaviour. Finally, the direct effect of experiences on pro-environmental behaviour was not significant in the wider path model (Figure 5.3), suggesting that the mediating roles of expansion and interdependence POs explain the effects of general oneness experiences on pro-environmental behaviour.

5.3.2 Humanity

Hypothesis H1aH) All three POs uniquely predict community aspirations

To test whether all three POs uniquely predicted community aspirations, four multiple regression analyses were conducted (see Table 5.12). The first three kept the three POs separate, and the fourth included all three POs in a single model. All models controlled for affect and socially desirable responding. The results of the first three models showed that expansion and essential both significantly predicted community aspirations, while interdependence did not. When including all three POs in one model, expansion was the only PO that had an effect on community aspirations, and this effect only reached borderline significance. Contrary to the hypothesis, these results suggest that expansion was the only PO that uniquely predicted community aspirations. Further, interdependence did not predict community aspirations even in the model in which it was isolated from the other POs.
However, it is worth noting that model 3 (IntH) did not reach Cohen’s (1992) recommended 0.8 power threshold with a power of 0.68, which increases the likelihood of incorrectly accepting the null hypothesis.

Table 5.12

<table>
<thead>
<tr>
<th>Community aspirations</th>
<th>1 ExpH</th>
<th>2 EssH</th>
<th>3 IntH</th>
<th>4 All</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>SE B</td>
<td>B</td>
<td>SE B</td>
</tr>
<tr>
<td>(Intercept)</td>
<td>4.74</td>
<td>0.48</td>
<td>4.72</td>
<td>0.48</td>
</tr>
<tr>
<td></td>
<td>***</td>
<td>***</td>
<td>***</td>
<td>***</td>
</tr>
<tr>
<td>ExpH</td>
<td>0.15</td>
<td>0.06</td>
<td>-0.26</td>
<td>0.26</td>
</tr>
<tr>
<td></td>
<td>**</td>
<td></td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>EssH</td>
<td></td>
<td></td>
<td>0.15</td>
<td>0.07</td>
</tr>
<tr>
<td></td>
<td>+</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IntH</td>
<td></td>
<td></td>
<td></td>
<td>0.08</td>
</tr>
<tr>
<td>Affect</td>
<td>-0.01</td>
<td>0.09</td>
<td>-0.14</td>
<td>-0.10</td>
</tr>
<tr>
<td></td>
<td>-0.10</td>
<td>0.09</td>
<td>-0.14</td>
<td>-0.09</td>
</tr>
<tr>
<td>BIDR</td>
<td>0.03</td>
<td>0.01</td>
<td>0.31</td>
<td>0.03</td>
</tr>
<tr>
<td></td>
<td>**</td>
<td></td>
<td>**</td>
<td>**</td>
</tr>
<tr>
<td>Adj. R2</td>
<td>0.11</td>
<td>0.09</td>
<td>0.07</td>
<td>0.07</td>
</tr>
<tr>
<td></td>
<td>***</td>
<td>**</td>
<td>*</td>
<td>**</td>
</tr>
</tbody>
</table>

Note. ExpH = expansion humanity; EssH = essential humanity; IntH = interdependence humanity; All = model including all predictors for humanity (ExpH, EssH, and IntH). BIDR = eight Impression Management items from the Balanced Inventory of Desirable Responding Short Form (BIDR-16: Hart et al., 2015; Paulhus, 1988). $B =$ unstandardised regression coefficient, $SE B =$ standard error of $B$, $\beta =$ standardised regression coefficient, $+p < 0.1$, $*p < 0.05$, $**p < 0.01$, $***p < 0.001$.

**Hypothesis H1bH) The three POs affect ProTs in different ways**

To test whether the three POs differentially predict how the wider human community is valued, four multiple regression analyses were conducted for Schultz’s (2001) altruistic concern (see Table 5.13). The hypotheses were that expansion and essential, but not interdependence, would uniquely predict altruistic concern.
Table 5.13

Summary of multiple regression models for the three psychological ontologies for the humanity scope predicting altruistic concern (n = 102)

<table>
<thead>
<tr>
<th></th>
<th>1 ExpH</th>
<th>2 EssH</th>
<th>3 IntH</th>
<th>4 All</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>SE B</td>
<td>β</td>
<td>B</td>
</tr>
<tr>
<td>(Intercept)</td>
<td>4.61</td>
<td>0.69</td>
<td>***</td>
<td>4.58</td>
</tr>
<tr>
<td>ExpH</td>
<td>0.22</td>
<td>0.09</td>
<td>0.24</td>
<td>0.22</td>
</tr>
<tr>
<td>EssH</td>
<td></td>
<td></td>
<td></td>
<td>0.20</td>
</tr>
<tr>
<td>IntH</td>
<td>-0.09</td>
<td>0.11</td>
<td>-0.08</td>
<td>-0.09</td>
</tr>
<tr>
<td>Affect</td>
<td>0.01</td>
<td>0.01</td>
<td>0.09</td>
<td>0.01</td>
</tr>
<tr>
<td>Adj. R2</td>
<td>0.03</td>
<td>0.02</td>
<td>0.03</td>
<td>0.03</td>
</tr>
</tbody>
</table>

Note. ExpH = expansion humanity; EssH = essential humanity; IntH = interdependence humanity; All = model including all predictors for humanity (ExpH, EssH, and IntH). BIDR = eight Impression Management items from the Balanced Inventory of Desirable Responding Short Form (BIDR-16: Hart et al., 2015; Paulhus, 1988). B = unstandardised regression coefficient, SE B = standard error of B, β = standardised regression coefficient, +p < 0.1, *p < 0.05, **p < 0.01, ***p < 0.001.

The results in Table 5.13 suggest that, consistent with the hypothesis, expansion and essential predicted altruistic concern. However, inconsistent with the hypothesis, interdependence also predicted altruistic concern. When including all three POs in one model, not one of them uniquely predicted altruistic concern. This suggests that the three POs, for the humanity scope, explain the same variance in altruistic concern. This is consistent with the results of factor analyses in Chapter 4 of the current thesis, which found that the models in which the three POs formed three separate factors did not have significantly more support than the models in which the three POs were collapsed into a single factor. This single factor (CompositeH, comprised of all the items from the expansion, essential, and interdependence POs for the humanity scope) is also included here to explore how it behaves in relation to Altruistic concern (Table 5.14).
It is worth noting that the effect sizes in Tables 5.13-14 were small in these analyses, ranging from 0.02-0.04. Of these, the greatest power achieved was 0.42, far below the recommended 0.8 threshold recommended by Cohen (1992).

Table 5.14

Summary of multiple regression model for the CompositeH measure predicting altruistic concern \((n = 102)\)

<table>
<thead>
<tr>
<th></th>
<th>(B)</th>
<th>(SE\ B)</th>
<th>(\beta)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Intercept)</td>
<td>4.27 ***</td>
<td>0.75</td>
<td></td>
</tr>
<tr>
<td>CompositeH</td>
<td>0.29 **</td>
<td>0.11</td>
<td>0.27</td>
</tr>
<tr>
<td>Affect</td>
<td>-0.11</td>
<td>0.11</td>
<td>-0.09</td>
</tr>
<tr>
<td>BIDR</td>
<td>0.01</td>
<td>0.01</td>
<td>0.09</td>
</tr>
<tr>
<td>Adj. (R^2)</td>
<td></td>
<td>0.04 +</td>
<td></td>
</tr>
</tbody>
</table>

Note. CompositeH = variable comprising all psychological ontology items for humanity; BIDR = eight Impression Management items from the Balanced Inventory of Desirable Responding Short Form (BIDR-16: Hart et al., 2015; Paulhus, 1988). \(B\) = unstandardised regression coefficient, \(SE\ B\) = standard error of \(B\), \(\beta\) = standardised regression coefficient, +\(p < 0.1\), **\(p < 0.01\), ***\(p < 0.001\).

The results of Table 5.14 are consistent with the hypothesis that beliefs/feelings about oneness with humanity predict altruistic concern. However, the collapsed nature of the CompositeH variable does not provide further nuance into any differential effects of different kinds of oneness with humanity on ProTs.

To test whether the three P0s form three different pathways to community aspirations (through altruistic concern or directly), the indirect and direct effects (see Table 5.15) of the relevant paths were taken from the wider hypothesised path model displayed in Figure 5.4. The original hypothesised paths were as follows:

i)    \(\text{expansion} \rightarrow \text{altruistic concern} \rightarrow \text{community aspirations}\)

ii)   \(\text{essential} \rightarrow \text{altruistic concern} \rightarrow \text{community aspirations}\)

iii)  \(\text{interdependence} \rightarrow \text{community aspirations}\)

An additional hypothesized path was added for the CompositeH variable:

iv)   CompositeH \(\rightarrow\) altruistic concern \(\rightarrow\) community aspirations
The indirect effect of CompositeH on community aspirations through altruistic concern (see Table 5.15) was taken from the wider path model for the CompositeH variable (Figure 5.5).

Table 5.15

*Indirect/direct effects from the three psychological ontologies/CompositeH to community aspirations (n = 102)*

<table>
<thead>
<tr>
<th>Path</th>
<th>Estimate</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>ExpH -&gt; Altruistic -&gt; Aspirations</td>
<td>0.03</td>
<td>-0.02 – 0.09</td>
</tr>
<tr>
<td>EssH -&gt; Altruistic -&gt; Aspirations</td>
<td>0.02</td>
<td>-0.06 – 0.08</td>
</tr>
<tr>
<td>IntN -&gt; Aspirations</td>
<td>-0.10</td>
<td>-0.27 – 0.06</td>
</tr>
<tr>
<td>CompositeH -&gt; Altruistic -&gt; Aspirations</td>
<td>0.05+</td>
<td>-0.004 – 0.11</td>
</tr>
</tbody>
</table>

*Note.* ExpH = expansion humanity; EssH = essential humanity; IntH = interdependence humanity; CompositeH = ExpH, EssH and IntH combined; Aspirations = community aspirations. All estimates controlled for affect and socially desirable responding using the eight Impression Management items from the Balanced Inventory of Desirable Responding Short Form (BIDR-16: Hart et al., 2015; Paulhus, 1988). CI = confidence interval; +p < 0.10.

These results suggest that, inconsistent with the hypothesis, there were no indirect effects of *expansion* or *essential* on community aspirations through altruistic concern; nor was there an effect of *interdependence* on community aspirations. However, somewhat consistent with the follow-up hypothesis, CompositeH had an indirect effect on community aspirations through altruistic concern, although it reached only borderline significance. These results suggest that general oneness with humanity may predict community aspirations through its effect on altruistic concern. They also suggest that the different *POs* are not likely to have differential effects on community aspirations through their hypothesised respective pathways.

It is worth noting that the relatively small $R^2$ values for altruistic concern in Figures 5.4-5 are, given the small sample size, also associated with insufficient power values of 0.59 and 0.63 respectively, which increases the likelihood of incorrectly accepting the null hypothesis. All other outcome and mediator variables in the models, however, have adequate power.
Figure 5.4. Path analysis for the humanity scope distinguishing between the three POs. ExpH = expansion; EssH = essential; IntH = interdependence. Aspirations = community aspirations. Values on straight lines represent standardised regression coefficients, controlling for affect and socially desirable responding. Values on curved lines represent Pearson’s correlation coefficients. Solid arrows represent hypothesised direct effects. +p < 0.1; *p < 0.05; **p < 0.01; ***p < 0.001 (n = 102).
Figure 5.5. Path analysis for the humanity scope combining the three POs into a single variable CompositeH. CompositeH = combined psychological ontology items for humanity. Aspirations = community aspirations. Values on straight lines represent standardised regression coefficients, controlling for affect and socially desirable responding. Values on curved lines represent Pearson’s correlation coefficients. Solid arrows represent hypothesised direct effects. \( + p < 0.1; \ast p < 0.05; \ast \ast p < 0.01; \ast \ast \ast p < 0.001 \) (n = 102).
**Hypothesis H2aH) Experiences predict all three POs**

To test whether general oneness experiences predicted all three POs, a multiple regression model was run for each PO, controlling for affect and socially desirable responding (Table 5.16). The results show that experiences significantly predicted all three POs. Experiences were also found to predict CompositeH. However, it is worth noting that model 2 (EssH) did not reach Cohen’s (1992) recommended 0.8 power threshold with a power of 0.68.

**Table 5.16**

Summary of multiple regression models for experience prediction the three psychological ontologies and CompositeH for the humanity scope (n = 102)

<table>
<thead>
<tr>
<th></th>
<th>1 ExpH</th>
<th>2 EssH</th>
<th>3 IntH</th>
<th>4 CompositeH</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Intercept)</td>
<td>4.02</td>
<td>4.47</td>
<td>3.96</td>
<td>4.15</td>
</tr>
<tr>
<td></td>
<td>***</td>
<td>***</td>
<td>***</td>
<td>***</td>
</tr>
<tr>
<td>Experience</td>
<td>0.32</td>
<td>0.21</td>
<td>0.30</td>
<td>0.28</td>
</tr>
<tr>
<td></td>
<td>***</td>
<td>***</td>
<td>***</td>
<td>***</td>
</tr>
<tr>
<td>Affect</td>
<td>0.16</td>
<td>0.11</td>
<td>0.12</td>
<td>0.17</td>
</tr>
<tr>
<td></td>
<td>+</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BIDR</td>
<td>-0.03</td>
<td>0.01</td>
<td>0.01</td>
<td>0.02</td>
</tr>
<tr>
<td></td>
<td>*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adj. R2</td>
<td>0.14</td>
<td>0.08</td>
<td>0.12</td>
<td>0.16</td>
</tr>
<tr>
<td></td>
<td>***</td>
<td>**</td>
<td>**</td>
<td>***</td>
</tr>
</tbody>
</table>

*Note. ExpH = expansion humanity; EssH = essential humanity; IntH = interdependence humanity; CompositeH = ExpH, EssH, and IntH combined; \( \beta \) = unstandardised regression coefficient; \( SE \beta \) = standard error of \( \beta \); \( \beta \) = standardised regression coefficient; \( +p < 0.1; *p < 0.05; **p < 0.01; ***p < 0.001 \); BIDR = eight Impression Management items from the Balanced Inventory of Desirable Responding Short Form (BIDR-16: Hart et al., 2015; Paulhus, 1988).*

**Hypothesis H2bH) Beliefs/feelings mediate between experiences and ProTs**

To test whether beliefs/feelings about the three POs mediated between experiences and ProTs, the indirect effects of the relevant paths (see Table 5.17) were taken from the wider hypothesized path model (Figure 5.4). The original hypothesized paths were as follows:

i) experiences -> expansion -> altruistic concern -> community aspirations

ii) experiences -> essential -> altruistic concern -> community aspirations

iii) experiences -> interdependence -> community aspirations
Table 5.17

Indirect effects from general oneness experiences to community aspirations through POs and altruistic concern where applicable (n = 102)

<table>
<thead>
<tr>
<th>Description</th>
<th>Estimate</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experience -&gt; ExpH -&gt; Altruistic -&gt; Aspirations</td>
<td>0.01</td>
<td>-0.01 – 0.03</td>
</tr>
<tr>
<td>Experience -&gt; EssH -&gt; Altruistic -&gt; Aspirations</td>
<td>0.00</td>
<td>-0.01 – 0.02</td>
</tr>
<tr>
<td>Experience -&gt; IntH -&gt; Aspirations</td>
<td>-0.03</td>
<td>-0.09 – 0.02</td>
</tr>
</tbody>
</table>

Note. ExpH = expansion humanity; EssH = essential humanity; IntH = interdependence humanity; CompositeH = ExpH, EssH and IntH combined; Aspirations = community aspirations. All estimates controlled for affect and socially desirable responding using the eight Impression Management items from the Balanced Inventory of Desirable Responding Short Form (BIDR-16: Hart et al., 2015; Paulhus, 1988). CI = confidence interval; *p < 0.05.

The results in Table 5.17 provide no support for any of the hypothesised paths from experiences to community aspirations. To explore further the idea that beliefs/feelings about the three POs are a mechanism by which transient oneness experiences can have effects that last beyond the experience itself, the mediating role of the three POs on shorter paths were also explored (Table 5.18). In particular:

- Experiences -> PO -> altruistic concern
- Experiences -> PO -> community aspirations

Table 5.18

Indirect effects from general oneness experiences to altruistic concern or community aspirations, through POs (n = 102)

<table>
<thead>
<tr>
<th>Description</th>
<th>Estimate</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experience -&gt; ExpH -&gt; Altruistic</td>
<td>0.04</td>
<td>-0.03 – 0.13</td>
</tr>
<tr>
<td>Experience -&gt; EssH -&gt; Altruistic</td>
<td>0.02</td>
<td>-0.06 – 0.13</td>
</tr>
<tr>
<td>Experience -&gt; ExpH -&gt; Aspirations</td>
<td>0.04</td>
<td>-0.02 – 0.11</td>
</tr>
<tr>
<td>Experience -&gt; EssH -&gt; Aspirations</td>
<td>0.01</td>
<td>-0.02 – 0.06</td>
</tr>
</tbody>
</table>

Note. ExpH = expansion humanity; EssH = essential humanity; IntH = interdependence humanity; CompositeH = ExpH, EssH and IntH combined; Aspirations = community aspirations. All estimates controlled for affect and socially desirable responding using the eight Impression Management items from the Balanced Inventory of Desirable Responding Short Form (BIDR-16: Hart et al., 2015; Paulhus, 1988). CI = confidence interval; *p < 0.05.

The results in Table 5.18 also provide no support for the hypothesis that beliefs/feelings about the three POs for the humanity scope are a mechanism by which experiences can exert an influence on ProTs beyond the end of the experience itself.
The mediating role of the CompositeH variable between experiences and ProTs (see Table 5.19) was also taken from the path model in Figure 5.5.

Table 5.19

<table>
<thead>
<tr>
<th>Description</th>
<th>Estimate</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experience -&gt; CompositeH -&gt; Altruistic</td>
<td>0.07</td>
<td>-0.003 – 0.17</td>
</tr>
<tr>
<td>Experience -&gt; CompositeH -&gt; Aspirations</td>
<td>0.02</td>
<td>-0.02 – 0.07</td>
</tr>
<tr>
<td>Experience -&gt; CompositeH -&gt; Altruistic -&gt; Aspirations</td>
<td>0.01</td>
<td>-0.001 – 0.04</td>
</tr>
</tbody>
</table>

*Note. CompositeH = combination of all psychological ontology items for humanity; Aspirations = community aspirations. All estimates controlled for affect and socially desirable responding using the eight Impression Management items from the Balanced Inventory of Desirable Responding Short Form (BIDR-16: Hart et al., 2015; Paulhus, 1988). CI = confidence interval; *p < 0.05.*

The results in Table 5.19 suggest that the CompositeH measure also does not mediate between general oneness experiences and ProTs.

**Summary**

Taking these humanity results together with the results of the general path models in Figures 5.4 and 5.5, only a slightly more nuanced understanding of the relationship between oneness and ProTs in the humanity scope can be gleaned. Distinguishing between the three POs in the humanity domain seems to have no practical implications for altruistic concern or community aspirations. When combining the three POs into one variable (CompositeH), the results suggest that there may be two paths from oneness to community aspirations: 1) from experiences directly to community aspirations, and 2) From CompositeH to community aspirations through altruistic concern. While experiences did predict CompositeH, CompositeH did not mediate between experiences and ProTs. The significant direct effect of experiences on community aspirations suggests that the mechanism by which fleeting oneness experiences influenced community aspirations beyond the end of the experience itself was not included in the model in this research.
5.4 Discussion

Although the general relationship between oneness and ProTs is well-established in the literature, the differential effects of different types of oneness had been largely untested until now. The present research began to address this gap in two broad ways: 1) by exploring how beliefs/feelings about different psychological ontologies (POs) can predict ProTs through different pathways; and 2) by exploring the possibility that general oneness experiences affect ProTs through their effects on these longer lasting oneness beliefs/feelings. In doing so, it also integrated oneness experiences, beliefs/feelings about the different POs, and ProTs into a path model. These relationships were explored within the two broad scopes of nature and humanity. The results from the nature scope are discussed below, before turning to the results from the humanity scope.

5.4.1 Nature

The results from the nature scope suggest that there are two important POs for ProTs, and that both relate with ProTs in different ways. In particular, expansion uniquely predicted biospheric concern, which suggests that perceiving nature to be part of the self is related to intrinsically valuing nature. In addition, interdependence was the only PO to predict altruistic concern, which suggests that perceiving the self to be part of a symbiotic system with nature is related to valuing nature for its instrumental role in others’ welfare.

Further, the results suggest that these two POs each have a unique pathway to pro-environmental behaviour. In particular, expansion predicted pro-environmental behaviour through biospheric concern, and interdependence predicted pro-environmental behaviour directly. These results shed light on the main motivating question of the research presented in this chapter: “the general idea that connectedness to nature predicts ProTs is well established, but what exactly is the nature of the connectedness that is doing the work?” The results presented in this chapter suggest that beliefs/feelings about expansion and interdependence POs are both important, but in different ways.

The importance of expansion is consistent with arguments that are already present in the literature. For example, Nisbet et al. (2009, p. 717-718) argued that the concept of nature relatedness involves a “self-construal that includes the natural world… so that damage to the planet is seen as damage to the self. It is also consistent with a central aspect of an ecological
identity, which is revealed by Naess and Drengson (2008, p. 85) when they wrote that “through identification, [people] may come to see that their own interests are served by conservation, through genuine self-love, the love of a widened and deepened self”. Finally, the results also support Cialdini et al.’s (1997) argument that the conditions that produce altruistic motivations based on intrinsically valuing others also produce an inclusion of other in the self.

The relationship between interdependence and instrumentally valuing nature (altruistic concern) is also consistent with arguments in the literature. For example, Davis et al. (2009, p. 174) argued that their concept of interdependence with the environment entails an understanding that “human beings are dependent both physically and emotionally on the natural environment; [and] in turn, the fates of species and ecosystems are dependent on the actions of human beings”. Similarly, Mayer and Frantz (2004) argued that if people “view themselves as egalitarian members of a broader natural community… [then they] view their welfare as related to the welfare of the nature world”. If one views their welfare as dependent on (rather than equivalent to) the welfare of the other, then by definition this would confer instrumental value to the other.

Both the Inclusion of Nature in the Self (INS) scale and the Connectedness to Nature (CTN) scale have shown a positive relationship with biospheric concern (Mayer & Frantz, 2004; Schultz, 2001). However, as I argued in Chapter 3 of the current thesis, and as Aron et al. (1992) noted, the overlapping circles paradigm used in the INS scale is open to interpretation with respect to its POs. In addition, the CTN scale is based on (and includes) language and concepts that refer to all three POs. The results presented in this chapter suggest that these scales likely predict biospheric concern to the extent that they measure expansion and not interdependence POs.

Further, Schultz (2001) found that biospheric concern correlated more strongly with self-transcendence values (positively) and self-enhancement values (negatively) than did altruistic concern, and suggested that altruistic concern may therefore represent an intermediate level of INS. On the contrary, the results presented in this chapter suggest that altruistic concern represents a qualitatively difference type of oneness with nature, namely one with an interdependence PO.

Finally, expansion (or including other in the self) is sometimes implied to be merely a useful heuristic for capturing general feelings of closeness or for capturing implicit
associations between self and other consistent with an overlap between the concepts of self and other. For example, Aron et al. (1992, p. 598) noted that the concept of inclusion of other in the self (IOS) “posits that in a close relationship the individual acts as if some or all aspects of the partner are partially the individual’s own” (emphasis added), and that the concept may also include a “sense of a more general union of self and other”. They continue by noting that the IOS scale “is consistent with many theoretical orientations” stating that it “is not necessarily linked to [self-expansion, but rather it]… is hypothesised to tap people’s sense of being interconnected with another… [which] may arise from all sorts of processes, conscious or unconscious, and including the other in the self may or may not be one of these processes”. It therefore was not clear whether participants would consciously endorse the explicit framing of connection to nature as including nature in the self, or whether it is just a useful metaphor for researchers to use when conceptualising other forms of connection to others. However, the results of the research presented in this chapter suggest that not only do some people consciously endorse including nature in the self, it was also the most important PO for ProTs.

Regarding the role of general oneness experiences, the results from the nature scope suggest that experiences predict beliefs/feelings about all three POs. This is consistent with the hypothesis that oneness experiences are sufficiently open to interpretation that they can create or reinforce beliefs/feelings about any or all of the three POs, depending on the knowledge and salient language people have available for interpreting those experiences.

Further, the two POs that were important for ProTs mediated the relationship between experiences and the associated pro-environmental behaviour. In particular, expansion formed a serial mediation with biospheric concern (experiences to expansion to biospheric concern to pro-environmental behaviour), and interdependence borderline significantly mediated the relationship between experiences and pro-environmental behaviour. Experiences did not have a direct effect on pro-environmental behaviour in the wider path model, suggesting that its effects on pro-environmental behaviour are fully explained by its effects through these two paths through two different POs.

These experience results suggest that translating oneness experiences into more stable, positive psychological dispositions towards the environment would benefit predominately from interpreting oneness experiences using language and metaphors that refer to nature being part of the self. However, if this language is not intuitively appealing to some
people, then interpreting these experiences using language and metaphors that refer to interdependence with nature might be a viable alternative. Given that expansion and interdependence POs represent quite different beliefs/feelings, this result is a reason to be optimistic, as it suggests that experiences can have an effect on ProTs for people with quite different worldviews or sets of beliefs. Curiously, language that refers to sharing an essence with nature appears not to be effective at carrying the effects of oneness experiences on ProTs, probably because the essential PO did not predict any of the ProTs used in the current research (at least within the population measured here). This negative result is discussed in detail in the next section.

The finding that oneness experiences are a source of oneness beliefs/feelings that go on to promote ProTs suggests that facilitating these kinds of experiences may be a useful strategy for fostering dispositions that enhance ProTs. One potential way of doing this is through immersion in nature (Shiota, Keltner, & Mossman, 2007; Weinstein et al., 2009). Interestingly, Shiota et al. (2007) found that spending time in nature was one of the most commonly desired subsequent activities after recalling an awe experience, suggesting a potential for a positive feedback in which time in nature promotes both awe and the desire to spend more time in nature, thereby predisposing oneself to more of the same kinds of awe experiences.

Further, psilocybin, the hallucinogenic compound found in magic mushrooms, often produces high ratings in the Mystical Experiences questionnaire (Griffiths et al., 2006; Griffiths et al., 2008; Griffiths et al., 2018), and has also been found to have effects on altruistic tendencies beyond a year after the experience (Griffiths et al., 2011). It would seem that psilocybin represents one way to induce oneness experiences. However, given that psilocybin and related substances are not legal in many countries, this is not a viable option for most people. It is worth pointing out that the Mystical Experiences questionnaire was originally designed to measure spontaneously occurring mystical experiences, such as those that might arise during meditation or various rituals, highlighting that there are many ways for people to predispose themselves to having oneness experiences. The multiple possible ways to induce oneness experiences is another reason to be optimistic, as it suggests that they might be experienced by people in a range of different contexts, with a various predispositions and beliefs.
5.4.1.1 Limitations and future research

While the results discussed so far are generally consistent with the hypotheses, a number of results were not consistent with the hypotheses, pointing to potential areas for future research and clarification. In particular, 1) essential did not predict biospheric concern or pro-environmental behaviour, which inhibited its ability to mediate between experiences and ProTs; 2) altruistic concern did not mediate the relationship between interdependence and pro-environmental behaviour; and 3) interdependence did not predict egoistic concern. These are addressed below.

No effect of the essential PO

The lack of an effect for essential is inconsistent with some of the theory and evidence in the literature. For example, Dutcher et al. (2007, p. 474) argued that their concept of connectivity with nature, which they define as a “sense of shared or common essence between the self, nature, and others” is the basis from which environmental values are derived. Their Connectivity to Nature scale, which is one of the few oneness measures that relatively effectively isolates its intended PO, was found to predict environmental concern and environmental behaviour in their research (Dutcher et al., 2007). Similarly, Garfield et al.’s (2014) Oneness Beliefs scale measures beliefs about shared spiritual and physical essence with everything, which they claim arise out of mystical experiences. Both physical and spiritual oneness were associated with environmental attitudes, and spiritual oneness predicted donations to an environmental charity. The results of the current research are inconsistent with this pattern.

Sharing an essence is also argued to be one way of conceptualising the feeling of kinship that comes from perceived similarity (Swann et al., 2012). The tendency for perceived shared essence to motive ProTs is such common knowledge that it even appears in popular usage. For example, the phrase “we all bleed the same colour blood” is intended to promote prosocial attitudes, and the use of the word “Earthlings” is intended to promote veganism. Yet despite all of these reasons to assume that a consciously construed shared essence between self and nature would predict ProTs, it did not.

This negative result might stem from the tendency for the essential PO to have a spiritual connotation. Indeed, Dutcher et al. (2007, p. 490) claim that their concept of connectivity with nature, with its essential PO, “may be an essentially spiritual
phenomenon”. There is debate regarding whether spirituality promotes ProTs (Dillon et al., 2003; Oh & Sarkisian, 2011), because it may tend to promote individualism (Bellah, Madsen, Sullivan, Swidler, & Tipton, 2007; Dillon et al., 2003; Farias & Lalljee, 2008) or possibly a Zen-like acceptance of the current state of affairs. Whatever the reason, Garfield et al. (2014, p. 356) noted that “in empirical work, no religiousness/spirituality construct has been consistently associated with pro-environmental attitudes and behaviour”. Similarly, Huber and MacDonald (2012) noted that the literature is inconsistent with respect to the relationship between spirituality and ProTs. The lack of an effect of essential, the most “spiritually loaded” PO, may therefore be consistent with this literature on the relationship between spiritual concepts and ProTs, and it suggests that future research would benefit from controlling for spirituality.

The unexpected result may not even be entirely inconsistent with the theoretical background of the oneness typology (Chapter 3 of the current thesis). That is, in the oneness typology, an essential PO was portrayed using a metaphor of discrete (countable) waves that come out of one ocean, where the ocean represents some shared spiritual or physical essence. Perhaps in some contexts (e.g., predominately individualistic cultures) such an orientation is prone to a focus on the discreteness of the waves (i.e., individualism). The discreteness of the waves in an essential PO was argued to be its strength, partly because it represented a possible source of intrinsically valuing something that is still meaningfully other, and therefore a solution to Cialdini et al.’s (1997) argument against Batson’s (1997; 2011) altruism. However, it appears that in the present study, the essential PO did not produce any kind of ProTs, whether underpinned by intrinsic value or not.

Future research could benefit from being more careful to represent an essential PO in a more physical way, as Garfield et al. (2014) did in their Oneness Beliefs scale. For example, Garfield et al.’s Physical Oneness subscale included items like “all parts of the universe – both living and non-living – are composed of the same fundamental materials” (Garfield et al., 2014, p. 360). This would be less likely to be interpreted in a spiritual light, and may therefore overcome any problems associated with the spiritual connotation of the measure. Further, the research could include both kinds, testing for differential effects of beliefs/feelings related to spiritual and physical shared essences.

One final limitation related to the negative result for the essential PO is that the participants were stage one psychology students in a New Zealand context with an average
age of around 19. It could be that the idea of sharing an essence with nature is a relatively esoteric concept that is not sufficiently salient or relatable for people in this demographic. Future research could test for variation in endorsement of an essential PO across age ranges, across pre-existing levels of religiosity or spirituality, and across cultural contexts. The potential for cross cultural differences are discussed in the section on general limitations below.

**Neither altruistic concern nor egoistic concern mediated the relationship between an interdependent PO and pro-environmental behaviour**

Although interdependence did predict both altruistic concern and pro-environmental behaviour, it did not predict pro-environmental behaviour through its effect on altruistic concern. Further, interdependence did not predict egoistic concern. Three possible explanations are discussed below.

1) Altruistic and egoistic concern do not validly measure instrumentally valuing the environment

The Environmental Concern scale (Schultz, 2001) was chosen for the current research because it is a short measure that appears elegantly to capture intrinsically valuing the environment (biospheric concern), and instrumentally valuing the environment (altruistic concern and egoistic concern). However, it seems to produce some counterintuitive results. In particular, consistent with Schultz’s (2001) previous research, altruistic concern did not predict self-reported environmental behaviour; and inconsistent with the same previous research, egoistic concern was significantly negatively correlated with self-reported environmental behaviour. These results suggest that instrumentally valuing the environment for the sake of other people does not predict pro-environmental behaviour, and that instrumentally valuing the environment for the sake of oneself makes one less likely to behave in environmentally responsible ways. Why would someone act in less environmentally friendly ways the more concerned they are about the effects of environmental damage on their own welfare? If one is highly concerned about the effects of environmental damage on the self or other people, then why should that not be a sufficient motivator of environmental behaviour?
A) To what extent are you concerned about the following relationships?

- Environmental damage → Environment itself
- Environmental damage → Other people
- Environmental damage → Myself

B) What is the most salient valued object to you?

- Environment
- Other people
- Myself

Figure 5.6. Elaboration on two alternative ways to interpret Schultz’s (2001) Environmental Concern scale.
One explanation is that the Environmental Concern scale does not measure what it intends to measure. That is, it might have measured how concerned respondents were about the biosphere/people/self in general, rather than the specific relationship between environmental damage and the object of concern. If so, then high scores in altruistic concern would represent a high relative importance placed on the welfare of other people, and high scores in egoistic concern might represent a high relative importance placed on one’s own welfare, rather than concern about the effects of environmental damage on those entities. See Figure 5.6 to help clarify the distinction.

If people interpret the measure in line with option A) in Figure 5.6, then all three would be expected to predict environmental behaviour. If people interpret the measure in line with option B), then only the first (environment itself) would be expected to predict environmental behaviour, which is the pattern found in the results of the present study. Further, in the present study, and inconsistent with previous research (Schultz, 2001), egoistic concern was significantly negatively related with biospheric concern, which also is more consistent with option B than with option A (i.e., in theory, concern for self and concern for environment are not mutually exclusive, so one could be concerned about the effects of environmental damage on all entities). Because the results of the current study are in line with option B, it is reasonable to consider the possibility that the altruistic concern subscale of the Environmental Concern scale did not validly measure instrumentally valuing the environment.

2) Interdependence PO predicts pro-environmental behaviour through a mediator not considered

This second point addresses the possibility that something other than instrumentally valuing nature mediates the relationship between interdependence and pro-environmental behaviour. One contender for an alternative mediator is the concept of commitment to the environment (J. L. Davis et al., 2009). Davis et al. (2009) argued that interdependence theory is an alternative theoretical framework to self-expansion theory that can be used to understand person-environment relationships. They note that “whether or not individuals feel ‘close’ or ‘connected’ to nature, they are interdependent with nature in the sense that the well-being of nature can affect the well-being of individuals (and vice versa)” (p. 174), implying that knowledge of this interdependence is apt to have an effect on behaviour and
motivations to protect the environment. According to interdependence theory, commitment is the felt manifestation of perceived interdependence.

Davis et al. (2009) found that commitment to the environment and inclusion of nature in the self independently predicted pro-environmental behaviour. To explore this possibility in relation to the measure of an interdependence PO used in the present research, future research would benefit from including a measure of commitment to the environment to test whether it mediates (fully or partially) between an interdependence PO and pro-environmental behaviour, and whether this forms a unique path to the one containing an expansion PO and biospheric concern.

3) The results confirm that instrumental value is less effective than intrinsic value at prompting action

Another possibility is that the interdependence PO does produce some sense of instrumentally valuing the environment; altruistic concern is a valid measure of this kind of instrumental value; and instrumentally valuing the environment in this way simply does not lead to pro-environmental behaviour. When altruistic concern was used as a measure of intrinsically valuing the wider human community in the present research on the humanity scope, it did predict a downstream ProT (community aspirations), suggesting that when it is treated as a measure of intrinsic value it predicts ProTs, but not when it is treated as a measure of instrumental value.

This explanation relies on altruistic and egoistic concern reflecting different kinds of instrumental value, because interdependence predicted altruistic but not egoistic concern. One way to account for this would be to distinguish between outwardly oriented and inwardly oriented instrumental value. Altruistic concern would be an example of outwardly oriented instrumental value, because the environment is valued for its utility, but towards other people rather than the self. Egoistic concern would be an example of inwardly oriented instrumental value, because the environment is valued for its utility for the self. It could be that oneness in general (i.e., all three POs) are associated with an outward orientation, resulting in any associated instrumentally valuing being of an outward oriented variety, hence the relationship between interdependence and altruistic concern but not between interdependence and egoistic concern.
5.4.2 Humanity

The results from the humanity scope suggest that the three POs do not have important differences for the ProTs used in the present research. All three predicted altruistic concern, and not one uniquely predicted it when all were included in a model together. However, consistent with the importance of expansion in the nature scope, there was borderline significant evidence that expansion was the only PO that uniquely predicted community aspirations. Also consistent with the nature results, experiences predicted all three POs. This adds further support to the hypothesis that general oneness experiences are sufficiently open to interpretation that they can create or reinforce a range of oneness beliefs/feelings.

The general lack of important differences between the three POs in the humanity scope is consistent with the results of the factor analysis in Chapter 4 of the present thesis, which found that the factor structure with the three separate POs was not significantly more likely than the factor structure collapsing them into a single factor. Using this collapsed factor, which was labelled CompositeH, some nuance was added to the understanding of the relationship between oneness and ProTs in the humanity scope. In particular, CompositeH significantly predicted both altruistic concern and community aspirations, suggesting that general oneness with humanity is associated with intrinsically valuing the humanity community and aspiring to contribute to the betterment of society. Further, there was a borderline significant indirect effect of CompositeH on community aspirations through altruistic concern, suggesting that the effect of CompositeH on community aspirations may be partly through its effect on altruistic concern. This suggests that beliefs/feelings about oneness with humanity might predict aspirations to behave in the interest of others because of its effects on deeply valuing others.

Regarding the effect of general oneness experiences, while they did predict CompositeH, they had no indirect effect on altruistic concern or community aspirations through CompositeH. The direct effect of oneness experiences on community aspirations, however, suggests that these kinds of experiences do predict some prosocial tendencies, just not through their effect on beliefs/feelings about general oneness with humanity. If it is true that oneness experiences must influence a longer lasting structure in order to affect ProTs beyond the end of the experience itself, then this structure appears not to be CompositeH on its own. It must, therefore, rely on something that was not considered in the present research. One possibility is that oneness experiences are more strongly related with oneness beliefs/feelings in the nature scope, and that these cross over into community aspirations.
Indeed, Weinstein et al. (2009) found that inclusion of nature in the self predicted community aspirations, providing evidence for such a cross-over effect.

Nonetheless, the practical implications of these results are that there are two ways that oneness can promote community aspirations. One is through promoting general oneness experiences, and the other is through more directly fostering beliefs/feelings about general oneness with humanity.

While the results from the humanity scope added some nuance to the understanding of the relationship between oneness and ProTs, many aspects of the hypotheses were not confirmed. In particular, 1) the three POs did not differentially affect ProTs; 2) beliefs/feelings about oneness with humanity did not mediate between experiences and ProTs; and 3) the results were more different between the humanity and nature scopes than expected. Areas for future research that might clarify these issues are discussed below.

5.4.2.1 Limitations and future research

One of the main limitations of the research on the humanity scope was that the PO subscales were relatively short at only two items each. This was because the three-item subscales constructed for the humanity scope in Chapter 4 had low reliabilities (Cronbach’s alphas), and it was found that their reliabilities could be increased to acceptable levels by deleting one problematic item from each subscale. Such a short scale might not adequately capture a given construct, and therefore a combination of short scales intended to capture three closely related concepts might not adequately distinguish between them. Future research would benefit from attempting to create longer measures that more convincingly distinguish between the three POs. The differential effects of the new measures on ProTs could then be tested.

Another main limitation of the research on the humanity scope is related to the measures of instrumentally and intrinsically valuing humanity. In particular, there was no measure of instrumentally valuing humanity, and the measure of intrinsically valuing humanity was indirect (i.e., altruistic concern about nature). Future research could include these measures so that the differential effects of POs on ProTs in the humanity scope can be more thoroughly tested. One possibility would be to create an analogous version of the Environmental Concern scale centred around humanity rather than nature. For example, an
analogous measure to biospheric concern for the humanity scope could involve asking people how concerned they are about social problems (rather than environmental ones) because of their effects on other people (rather than other animals and plants).

Another area for future research is related to the scope itself. The present research only focussed on the two broad scopes of humanity and nature. These were initially chosen because they were at a similarly broad level to the broad ProTs of interest to the research. Given their similarity in this regard, it was assumed that the relationships between oneness and ProTs would be similar across both scopes. However, the results revealed this not to be the case. The differences could be due to the kinds of methodological limitations already outlined, but they could also be due to important differences between the scopes and how oneness and its relationship to ProTs acts therein. These are discussed below.

**Differences between humanity and nature scopes**

Oneness with humanity and oneness with nature might be more different phenomena than was assumed. There is a common trend in the oneness literature with nature to draw on models developed in the humanity domain (i.e., in the study of interpersonal relationships). For example, Schultz (2002), Dutcher et al. (2007), and Leary et al. (2008) all cite Aron et al.’s (1992) concept and measure of Inclusion of Other in the Self to justify and explain their concepts related to oneness with nature. Further, interdependence with the environment (J. L. Davis et al., 2009) is modelled on an alternative model of human relationships to IOS, namely interdependence in close relationships (Agnew et al., 1998). However, models that were developed for understanding close human relationships may not be applicable to relationships with larger, abstract concepts like nature, or for that matter even abstract human-centred concepts like humanity. Consistent with this, Moreton, Arena, and Tiliopoulos (2019) found that perceptions of connectedness to nature were more closely related to perceptions of connectedness to abstract human groups, like humanity, than to specific relationships. This suggests that oneness with broad categories might be a different phenomenon than oneness with specific categories. Although nature and humanity in the present research are both broad categories, nature may be still be sufficiently more broad to expect some differences between them.

Schubert and Otten (2002) also made an argument that there are differences between oneness with specific others and oneness with larger human groups. In particular, they argued
that while inclusion of other in the self might make intuitive sense for people in close relationships, oneness with groups is more intuitively conceptualised as inclusion of self in the group. However, the results of the present study found that the expansion PO for the nature scope was the only type of oneness that behaved in line with all of its relevant hypotheses, suggesting that inclusion nature in the self does make intuitive sense to people (at least the people measured in this research). Reconciling this result with Schubert and Otten’s argument may require representing self-expansion as intuitive at the two extremes (i.e., including partner/family in the self, and including nature/life/all of existence in the self). Humanity might represent a middle ground between these extremes that people tend to find less intuitive or relatable.

This idea of humanity as a kind of middle ground that might not be as intuitively associated with oneness is also consistent with two characteristics of oneness experiences. The first is that oneness experiences tend to be characterised as ‘boundary dissolving’, such that they would be expected to be associated with oneness beliefs and intuitions towards entities that are larger and less bounded – characteristics that are more in line with nature than with humanity. Indeed, in the results of the research presented in this chapter, the relationships between experiences and the three POs were stronger for the nature scope. Future research could compare the priming effects of nature-related contexts and human-related contexts on oneness experiences to explore this possibility further.

The second is that oneness experiences may be more frequently induced by nature than by humanity. For example, Shiota et al. (2007) found that nature was one of the most common elicitors of awe, which in turn motivated people to go back to nature, thereby further strengthening the association between nature and oneness experiences. The tendency for oneness experiences to be more strongly associated with the nature scope may also explain the present study’s finding that experiences did form the start of a significant path to ProTs through oneness beliefs/feelings for the nature scope but not for the humanity scope. That is, if a given oneness experience is associated with nature, then it might be more conducive to triggering a path from oneness beliefs/feelings to ProTs within the same domain that prompted the experience, just by association. To test for this possibility, future research could control for the context of the oneness experience, distinguishing nature-related contexts from human-related contexts. If human-related contexts do have an indirect effect on community aspirations through oneness with humanity, then this explanation would be supported.
Differences between the nature and humanity scopes might also be related to differences in the characteristics of person-person and person-nature relationships. In particular, person-person relationships are loaded with a range of norms, expectations, “tribal” loyalty, and emotional responses based on previous experiences (e.g., Y. Chen & Li, 2009; Feather & Sherman, 2002; Fehr, Fischbacher, & Gächter, 2002; Stets & Burke, 2000; Takahashi et al., 2009). For example, while nature may be easily perceived as an “innocent other” worthy of our protection, other humans are morally accountable and therefore are prone to being perceived as worthy of protection only under certain circumstances. How can people feel oneness with humanity, when every day we are presented with a range of atrocities that other humans have committed? For some people, the wider human community does not necessarily have the warm, familial connotation that it does for others. Similarly, I have noticed the irony of past instances where I have become unreasonably frustrated at another driver while on the way to a long run in the Waitākere Ranges, an activity I practised partly because of the opportunity for connection to nature. Get out of the way, you are making me late for my oneness experience! For oneness with humanity to manifest in ProTs, it might require the presence of another variable such as trust (G. R. Jones & George, 1998). That is, deeply valuing the other might come from the oneness beliefs/feelings, while the trust would remove potential barriers between the oneness and the desired ProTs. This idea is consistent with the finding that people tend to be ‘conditional cooperators’ (Fehr & Fischbacher, 2004; Fischbacher, Gächter, & Fehr, 2001; Keser & Van Winden, 2000), meaning that they have a desire to do good, but not if they are the only one doing the good.

5.4.3 General limitations and future research

There are also three limitations that apply to the study in general and that future research might wish to address. Perhaps the most important is related to the demographics of the participants, namely that the participants were relatively young with an average age of around 19, and it was conducted in a New Zealand (i.e., Western) context. The distinctions between the three POs are relatively nuanced, and the items chosen to measure them might not be relatable for younger people. That is, the ability or tendency to relate to relatively sophisticated ways of conceptualising how one’s life fits into larger schemes might increase (or at least vary) with age. This might be because older people have had more time to have oneness experiences, have been exposed to more different ways of conceptualising their place in the world at large, or place a higher importance on self-transcendence in general. Future
research would benefit from measuring different types of oneness and their relationship with ProTs across range of ages to explore this further.

Further, given that one of the main arguments of the research in this chapter is that oneness experiences can be interpreted in different ways depending on pre-existing perspectives and knowledge, it would be important and insightful to explore these relationships in different cultures (i.e., cultures that are characterised by different world-views and belief systems). That is, different cultural contexts would likely explain variation in the relative endorsement of the three POs, and possibly the extent to which they affect ProTs.

Stroink and DeCicco (2011, p. 929) noted that “individuals tend to make assumptions about how their sense of selfhood relates to its social and physical environment, and these assumptions are generally formed implicitly through culture-specific socialisation”. In their study that sought to relate the metapersonal self-construal (MSC) to the literature on values and cultural variation, Stroink and DeCicco (2011) found that MSC scores were higher on average for Buddhists compared to Christians (controlling for religiosity); and that Aboriginal-Canadians who participated in and identified with their traditional Aboriginal culture had higher MSC scores on average than those who did not. These results are consistent with their prediction that MSC scores would be predicted by “cultural-religious groups that endorse and socialise a view of the self as fundamentally interconnected with all life” (p. 920). They also found that MSC was uniquely related to the values of “spirituality” and “universalism”. While they do not report any results relating to cultural-religious variation in values that is explained through variation in MSC (i.e., a mediation analysis), these results do suggest that the MSC captures a unique view of the self that reflects particular kinds of beliefs and values that are transmitted culturally, and they highlight the general importance of cross-cultural research in this area.

This idea can be linked back to the results of the research from the current chapter, using individualism and collectivism as an example dimension of cross-cultural variation. It could be that in more individualistic, Western cultures (such as the one used in this research: New Zealand), an expansion PO is expected to be the most salient way of construing a deep connection to others (e.g., a connection that confers a sense that the other has intrinsic value). This would allow the deep connection to still be interpreted using familiar language that emphasises the self. People from cultures that place less of an emphasis on the self, on the
other hand, might find an essential PO to be a more salient way of construing a deep connection to others. Further, the conditions that bring about the endorsement of an essential PO in more individualistic cultures might include higher levels of spirituality. Spirituality in more individualistic cultures may not be grounded in a tradition that emphasises self-transcendence, and therefore may be prone to a ‘self-help’ focus that would not be expected to predict ProTs, which is consistent with the results of the current research (i.e., experiences did predict essential, but essential did not predict ProTs). Finally, an interdependence PO might also be expected to be relatively strong in more individualistic, Western cultures, because it emphasises the interactional level at which we are still individuals, despite being connected via a symbiotic relationship. However, one could conversely argue that an interdependence PO would be relatively strong in more collectivistic culture, given that interdependence in general tends to be positively correlated with collectivism (e.g., Kagitcibasi, 2005), and collectivism may be associated with norms of reciprocity, as is the case in Chinese culture (Wu et al., 2006). Although individualism-collectivism is only one small component of cross-cultural variation, these speculations highlight the kinds of relationships that can be explored in future cross-cultural research (explored in more depth in Chapter 6).

Another more general limitation is that there were only two levels of scope considered here. As already discussed, humanity might represent a middle ground scope with which oneness is less intuitively understood than close others or all-encompassing entities like nature and all of existence. This can be fully explored in future research by testing the extent to which people can hold beliefs/feelings about the three POs for a range of scopes, like a neighbourhood, specific place, nation, or country.

The final two general limitations mentioned here are methodological ones. One is that the research in this chapter did not use an experimental design, meaning that any causal relationships implied by the path model are only tentative. Future research could seek to confirm these causal relationships by experimentally inducing oneness experiences, and measuring their effects on oneness beliefs/feelings, and on ProTs.

The other is that the sample size of 102 was relatively small, resulting in some of the analyses being underpowered, as highlighted throughout the results section. Insufficient power can reduce the reliability of the results in general and can also increase the chance of incorrectly accepting a null hypothesis (J. Cohen, 1992). The latter may be particularly
important for some of the negative/borderline results in this study. In particular, the lack of mediating effects of altruistic and egoistic concerns on the relationship between IntN and pro-environmental behaviour; the lack of a mediating effect of altruistic concern on the relationship between CompositeH and community aspirations; and the lack of an effect of IntH on community aspirations. The former is important for the confidence that can be placed in the results and their subsequent interpretations in general. There is therefore a need for future replications with larger sample sizes.

5.5 Conclusion

The relationship between oneness and ProTs in the literature suggests that oneness is an important psychological precursor to ProTs. However, the differential role of different types of oneness has been largely overlooked. The results of the current research confirm the general trend in the literature, namely that oneness with nature and humanity predict ProTs. The research on the humanity scope was unable to add nuance to this relationship. However, the research on the nature scope did provide a more nuanced understanding of the relationship. In particular, oneness predicted ProTs through two distinct pathways: 1) expansion to intrinsically valuing nature to pro-environmental behaviour, and 2) interdependence directly to environmental behaviour. Despite being associated with quite different beliefs/intuitions about how one is connected to nature, both paths appear to be at least partly created or reinforced by fleeting, general oneness experiences. The evidence for this was stronger for the expansion path than the interdependent path, suggesting that the combination of oneness experiences with attempts to integrate them using language that implies self-expansion may be most conducive to fostering deep environmental values and behaviour (at least in the context of a New Zealand university). Nonetheless, the results also suggest that if such a conceptualisation is unable to be integrated into a person’s existing worldview or knowledge structure, that language emphasising interdependence may also be effective at fostering environmental behaviour (albeit without being based in a deeper sense of valuing nature). This is a reason to be optimistic, as the interdependence and expansion POs together capture a wide range of potential ways to construe how one is connected to nature. Although the language and concepts that will be most effective at fostering the different POs might vary cross-culturally, these results suggest that the potential to encourage ProTs through these different types of oneness may apply across people with a range of perspectives, even within a given cultural context.
Chapter 6

General Discussion

The general discussion first will re-iterate the main goals of the thesis and summarise the important findings from Chapters 2-5 in relation to these goals. The rest of the discussion will focus on a number of more broad points that relate to the thesis as a whole. In particular, Batson’s (Batson et al., 1997; Batson, 2011) model of altruism will be revisited, with an emphasis on the relationship between self-expansion and intrinsically valuing the other. Following this, comments on the oneness typology will be made, with suggestions for possible refinements. Finally, limitations of the thesis on the whole will be addressed with respect to the areas for future research that they identify, which will be followed by a conclusion.

6.1 Summary of main aims and findings

This thesis sought to contribute to the understanding of the psychological concept of oneness and how it relates to prosocial and pro-environmental tendencies (ProTs). There were two main strands to this overarching goal. The first was the development of a oneness typology, whose construction was based on the language used in the extant oneness concepts (and closely related notions) and their measures. The oneness typology was intended to provide conceptual clarity, guide future research, and be supported statistically.

Chapter 3 outlined the typology and the process of its construction. In doing so, it achieved the goal of providing conceptual clarity around the psychological concept of oneness. The figure that summarises the dimensions and sub-dimensions is displayed here again for clarity (Figure 6.1). To recap, oneness is defined as a belief and/or feeling and/or experience \((\text{manifestation})\) of profound connection to the other, where the connection is perceived as an \(\text{expansion}\) to include the other in the self, and/or as \(\text{interdependence}\) with the other, and/or as sharing an \(\text{essential}\) property with the other \((\text{psychological ontology})\); where the other is a self-transcendent entity at a range of scales or \(\text{scopes}\) from close others to all of existence.
The typology also helps to navigate the literature on oneness. For example, upon reviewing Mayer and Frantz’s (2004) conceptualisation of connectedness to nature and its associated scale, the oneness typology highlights that the concept refers to oneness with the following characteristics: a nature scope; a feeling manifestation (although the self-report measure includes both belief and feeling manifestations); and a conceptual background in interdependence and expansion psychological ontologies (POs; although the self-report measure would seem to capture all three POs, including essential). This means that research that uses this scale can only attribute any effects to a more general sense of oneness with nature, because it does not distinguish between the three POs. There is nothing inherently wrong with working with a more general sense of oneness. However, highlighting this kind of conceptual variation across different concepts and their measures allows researchers to choose the most appropriate concept and measure for their aims. The categorisation made possible by the typology is also important for compiling or comparing results across multiple studies that use different scales. That is, it allows for patterns of results across studies to be mapped onto patterns in the oneness content of the scales across studies.

Figure 6.1. The three dimensions of the oneness typology. Manifestation and psychological ontology each have three sub-dimensions, but scope is theoretically continuous.
Chapter 3 also outlined the ways in which the typology can be used to guide future research. Given that this thesis was concerned with the relationship between oneness and prosocial and pro-environmental tendencies (ProTs), it focused on potential future research in this domain, although future research could focus on other potential consequences of oneness, like well-being. One of the main ways that the typology was argued to guide future research is in the different ways that the three POs would be expected to relate to ProTs. In particular, all three POs were argued to be expected to predict helping tendencies; however, expansion and essential were argued to do this through a sense of intrinsically valuing others; while interdependence was argued to this through a sense of instrumentally valuing others. These relationships had not previously been tested, because the conceptual variation that the typology highlights had not yet been systematically organised. Further, Chapter 3 highlighted that few measures specifically positioned themselves on all three dimensions of the typology, and not one was designed to distinguish between all three POs. This highlighted that a more nuanced understanding of the relationship between oneness and ProTs could be explored in future research with the help of a novel scale that did make the kinds of distinctions in the typology. Such a scale was produced in Chapter 4. One final way that the typology may help to guide future research is that even if researchers are not interested in the differential effects of different types of oneness, they might be interested in the effects of just one specific type. The typology would help those researchers to identify the type that is of interest to them.

Chapter 4 provided statistical support for the typology. However, after an initial, complex attempt at exploratory factor analysis, the typology was refined such that the experience manifestation was no longer thought to distinguish between the three POs. It also combined the operational definitions of the belief and feeling manifestations into a single belief/feeling manifestation with the prefix “I feel that…”, making a more elegant operationalisation of the two manifestations. As a result, confirmatory factor analysis found support for one factor for each of the three POs (with the belief/feeling manifestation) for the nature scope. In addition, general oneness experiences were confirmed as a separate factor. However, for the humanity scope, there was only marginal support for the distinctness of the three POs, although experiences were still confirmed as a separate factor to beliefs/feelings. This suggested that there was good reason to keep the three POs separate in research on oneness with nature, while the reasons to keep the three POs separate in research on oneness with humanity may depend on other theoretical considerations.
The second main aim of this thesis was to contribute to the understanding of how oneness relates to ProTs. Most of the contribution to this aim came from applying the oneness typology, using its different dimensions to explore nuance in how oneness relates to ProTs. However, the pilot study presented in Chapter 2 also addressed this second aim, but before I had fully organised the literature into the oneness typology. The pilot study was an attempt to test the effect of two novel oneness primes (eye gaze and the revelation of shared infinite values) on established measures of oneness and ProTs, so that evidence of a causal relationship between oneness and ProTs could be added to the plentiful correlational evidence. However, the results did not show the expected relationships, which prompted the conceptual work that led to the construction of the oneness typology, revealing new limitations and gaps in the literature. After having constructed the typology, I reanalysed the data from the pilot study, using only the items that that exclusively referred to either to an essential or interdependence PO that were already present in the pre-existing scales that were used in the pilot study. The results of this follow-up analysis revealed that both essential and interdependence POSs correlated with each other, with items referring to general oneness, and with community aspirations, suggesting that these two POSs have convergent and predictive validity. These results were only preliminary, because the essential and interdependence measures were compiled in a post-hoc fashion, comprising only a few items from the scales used in Study 1. Nonetheless, they did support the potential utility of some aspects of the typology for conceptualising oneness and its relationship with ProTs.

Chapter 5 represented the main contribution to the second aim of the thesis. It presented the results of a study that applied the scales developed in Chapter 4 to explore a more nuanced relationship between oneness and ProTs. The results suggested that including nature in the self (expansion) led to intrinsically valuing nature, which led to an increased tendency to act in pro-environmental ways. Further, perceiving the self as interdependent with nature (interdependence) led to instrumentally valuing nature for its importance to other people. However, this perceived instrumental value did not lead to an increased tendency to behave in pro-environmental ways. Rather, the perceived interdependent connection led directly to pro-environmental behaviour. Finally, sharing an essence with nature (essential) did not lead to intrinsically value nature or acting in pro-environmental ways. These results suggest that different POSs in the typology do differentially affect ProTs, and that distinguishing between them is therefore important.
The results of Chapter 5 also added nuance to the role of general oneness experiences on ProTs. It was noted that oneness experiences are fleeting, and therefore must induce some lasting change in order to have an effect on ProTs that extends beyond the end of the experience itself. The results suggested that oneness experiences can create or reinforce any of the three POs. This may be owing to their tendency to be both ineffable and boundary dissolving (Hood, 1975; MacLean et al., 2012), allowing them to be interpreted using whatever suitable language and concepts happen to be salient to a person (Garside, 1972; Hood et al., 2001; Yamane, 2000). Further, the results also suggested that when these experiences are interpreted in line with expansion and interdependence POs, these interpretations went on to predict the ProTs in line with the results already mentioned (i.e., through intrinsically valuing to behaviour, or directly to behaviour, respectively). That is, oneness experiences, in their pure form, may be the same for different people in different contexts (what Hood (2006) calls the “common core hypothesis”), but their interpretations and subsequent effects can vary (Z. Chen et al., 2011; Z. Chen et al., 2011; Garside, 1972; Hood et al., 2001; Yamane, 2000).

The results for the humanity scope found that distinguishing between the POs was not important for ProTs. Collapsing the three POs into a single factor, the results suggested that general oneness with humanity may be associated with aspiring to contribute to the betterment of society (community aspirations) through a sense of valuing the wider human community for its own sake (altruistic concern). The results also suggested that general oneness experiences lead to general oneness with humanity and the ProT of community aspirations. However, general oneness with humanity did not mediate between oneness experiences and community aspirations or altruistic concern, suggesting that beliefs/feelings about oneness with humanity do not carry forward to prosocial effects of oneness experiences. Possible explanations for the differences between the nature and humanity scope were discussed, including the idea that oneness experiences tend to be boundary dissolving, and therefore to be associated more strongly with boundless entities like nature, and the related idea that oneness experiences tend to occur in nature, so they are more strongly associated with oneness and ProTs in the domain in which they occurred.

The results of Chapter 5 are important because they suggested that the three POs do indeed have differential effects on ProTs (at least for the nature scope). Most measures of oneness in the literature conflate multiple POs, so it cannot be discerned which PO is doing the work in a given relationship. The results presented here suggest that, for nature,
interdependence and expansion tend to do the work, at least in the context of a New Zealand university. They also suggested that fostering oneness experiences might be particularly useful for fostering ProTs when combined with an attempt to integrate the experience using language and metaphors that emphasise expansion or interdependence. Further, expansion and interdependence are rather different POs, suggesting people with different worldviews and knowledge structures may be able to integrate oneness experiences in some way that is conducive to more stable increases in ProTs.

While the research throughout this thesis has addressed its main goals, there are a number of limitations that can be explored further in future research. These are discussed at the end of the Chapter. Before addressing the general limitations, I will cover two more broad discussion points, beginning with Batson’s (1997; 2011) altruism and the close link between expansion and intrinsically valuing others.

6.2 Altruism, expansion, and intrinsically valuing others

A key debate in the literature on the relationship between oneness and ProTs relates to whether Batson’s model of altruism, which requires intrinsically valuing others, is inherently self or other focussed (Batson et al., 1997; Cialdini et al., 1997). It is therefore worth relating these results back to this debate. According to Batson (2011), altruism is a motivation to help another that is based on intrinsically valuing their welfare. Cialdini et al. (1997) argued that the conditions that produce altruistic motivations tend to produce an inclusion of other in the self, such that the motivation is no longer other-oriented (and therefore not altruism per se). At first, I thought an essential PO would solve this problem, as it was hypothesised to produce a sense of intrinsically valuing the other without including them in the self. However, the research presented in this thesis found that essential did not increase people’s propensities towards intrinsically valuing the other, or even helpful behaviour. Rather, the only path to intrinsically valuing the other was through expansion. At first glance this appears to support Cialdini et al.’s argument and not Batson’s.

However, there are two alternative interpretations of the close link found between expansion and intrinsically valuing others that may not undermine Batson’s notion of altruism. The first is that consciously endorsing expansion items may not represent true inclusion of other in the self, but instead may represent only a heuristic for conceptualising a
sense of deep connection between self and other. Batson (1997) defended his model of altruism against Cialdini et al.’s (1997) critique in a similar way, by claiming that the critique is only a problem to the extent that Aron et al.’s (1992) Inclusion of Other in the Self scale truly represents self-other indistinguishability, arguing that such a scale did not represent indistinguishability. Indeed, the items used in the measure of expansion in the present thesis are more in line with using it as a heuristic than with taking it literally, because they all used the prefix “I feel that”. For example, “I feel that nature is a part of myself”. An even stronger emphasis could have been placed on the heuristic nature of expansion by rephrasing the item to “I feel deeply connected to the natural world, as though it is a part myself”. However, this argument comes with a potential problem. That is, if expansion is just a heuristic for conceptualising some more general sense of deep connection, then could the same not be said for essential? In which case, does this not undermine one of the main distinctions made by the typology?

The results in Chapter 5 suggest that it is still important to keep them distinct. In these results, both expansion and essential had similar mean scores (4.77 and 4.97 respectively), and both had a significant root in general oneness experiences, yet essential did not predict any of the ProTs it was hypothesised to predict, while expansion did. That is, people who tend to use an expansion heuristic also tend to intrinsically value nature and behave in pro-environmental ways, while people who tend to use an essential heuristic show no disposition towards these types of ProTs. This difference would suggest that the language and concepts used to construe oneness go on to have important effects. That is, construing oneness as including the other in the self seems to matter more for ProTs than does construing oneness as sharing an essence with the other.

Another way of interpreting the close link between expansion and intrinsically valuing the other that does not undermine Batson’s notion of altruism is still to deny that the expansion items capture self-other indistinguishability, but to place the source of the expansion in the sense of intrinsically valuing the other. That is, while the theorising throughout the thesis so far has held that expansion predicts intrinsically valuing the other, it might be better conceptualised as the other way around. In other words, the sense of intrinsically valuing something could act as an implicit indicator for what counts as self. As Pappas and Friedman (2007, p. 324) noted, the self is a “slippery” concept, so it would make sense for people to use heuristics for what counts as self; and a sense of intrinsically valuing something (i.e., valuing it as though it is the self) could be interpreted more simply as a sense...
that the other is part of the self. In the introduction to this thesis I distinguished between three types of self-transcendence: self-transcendence as a momentary loss of self-awareness; self-transcendence as going beyond the self as the only object of ultimate concern; and self-transcendence as perceiving a oneness connection with an entity that is larger than the immediate self. If the interpretation in this paragraph is correct, then expansion may represent a synthesis of the latter two types of self-transcendence. That is, perceiving another as an object of ultimate concern, and thereby coming to feel as though they are part of the self.

Stone (2012, p. 495) made a similar claim when he observed that “to acknowledge anything as sacred is to move beyond the boundaries of the self”, implying that perceived sacredness (i.e., perceived intrinsic value) entails transcending the boundaries of the self. Similarly, Naess and Drengson (2008, p. 95) argued that “dwelling in situations of intrinsic value… is conducive to self-realization”, where they define self-realisation as fostering an ecological identity in which the world at large is included in the self. In doing so, they imply that an ecological self (i.e., an expanded self) develops through exposure to contexts in which things other than the narrow self are perceived to have intrinsic value.

Interestingly, Naess and Drengson (2008, p. 81) also argued that when acting in accordance with a widened and deepened self (one that has expanded to include the other), we act “beautifully” rather than “altruistically”, suggesting that acting on perceived intrinsic value is somewhat deeper than altruism. However, they defined altruism as acting on moral or dutiful principles, rather than on the compassion and intrinsic value that is central to Batson’s (2011) definition of altruism. If intrinsic value is conducive to expansion, then Batson’s altruism (which requires intrinsically valuing the other) would seem to qualify as this kind of “beauty”. With this in mind, I think that Naess and Drengson’s notion of acting beautifully, Batson’s altruism, and the close link between expansion and intrinsically valuing nature found in the present research are all describing roughly the same phenomenon.

The close link between intrinsically valuing and expansion does not necessarily mean that essential in principle cannot be associated with intrinsically valuing others. The idea that the self is that which you intrinsically value, and the idea that acting from an expanded self is the “beautiful” pinnacle of other-directed tendencies would both seem to make the most sense within cultural narratives that emphasise the centrality of the self. It might be that a more individualistic Western narrative (e.g., Imada, 2012; Markus & Kitayama, 1991; Neff, Pisitsungkagarn, & Hsieh, 2008; Sampson, 2000) is exerting its influence (or at least
providing the familiar terms) in Batson and Naess’s work, and in the responses of the participants used in the present research. That is, within a narrative that emphasises the intrinsic value of the self, it is no surprise that a sense of intrinsically valuing others would be interpreted as an extension of the self. Would it still be reasonable to expect that a sense of intrinsically valuing others would be interpreted in self-related terms in the context of cultural narratives that do not emphasise the self? Could acting, for example, from a place of humility and self-diminishment when awe-inspired by the wonder in other entities still count as acting “beautifully”?

Direct answers to these questions would require future research. However, a variety of cross-cultural studies in related areas suggest how the essential PO could be linked to intrinsically valuing others in the context of certain cultural narratives. For example, Neff et al. (2008) compared the contribution of self-construal to self-compassion across three different cultures, Thai, Taiwanese, and American. They found that interdependent self-construal predicted self-compassion among Thais but self-judgment among Taiwanese, while independent self-construal predicted self-compassion among Taiwanese and Americans. The authors argued that this is because in Taiwanese culture, interdependence is associated with the fear of ostracism, which leads people to strive for self-improvement through a self-critical eye with its roots in Confucian philosophy. Independence in this context would represent a break from this pattern, and therefore offer some room for self-compassion. In Thai culture, on the other hand, interdependence is associated with Theravada Buddhism, which holds as basic truths the inherent suffering and imperfection in human existence, and the permanent flux of everything (including the self). Self-compassion more naturally extends from this forgiving view of perceived short-comings in the self (or indeed in others). Further, this narrative may be conducive to a link between essential oneness and a sense of intrinsically valuing others, because the centrality of the self is de-emphasised by its state of being in flux. As for the Americans, the relationship between independence and self-compassion was argued to stem not out of opposition to a relatively self-critical form of interdependence, but rather out of the importance placed on positive self-regard. This emphasis on the self may also explain the higher self-esteem found among the Americans compared to the Thais and Taiwanese, and would be conducive to a link between expansion and intrinsically valuing others, as found in the present research.

In another example, Stroink and DeCicco (2011) studied self-construal and Schwartz’s (1992; 2012) value dimensions across different cultural and religious groups in
Canada. They found that metapersonal self-construal (which is a oneness concept that has elements of *essential* and *expansion* POs with a scope that covers all of existence) uniquely predicted the value of universalism (compared to interdependent and independent self-construals), which they described as a guiding principle of “appreciating and protecting all humanity and nature” (Stroink & DeCicco, 2011, p. 924). They also found that Buddhists had a higher metapersonal self-construal than did Canadian Christians, which the authors attribute to the Buddhist emphasis on the illusory nature of the self. However, the two groups did not significantly differ in the universalism value, suggesting that despite Buddhists having a higher degree of a particular oneness concept, both groups still had a deep valuing of other people and the planet. This suggests that the two different cultural narratives can be similarly associated with deeply valuing others, while being dissimilarly associated with particular types of oneness. The authors also argue that Hindu culture would be expected to behave similarly to Buddhist culture, because of the Hindu belief that everything, including the self, is a small part of a “sacred natural order” (p. 921). The illusory self of the Buddhist view, and the small self as part of a sacred order of the Hindu view, would both be expected to produce a link between an *essential PO* and intrinsically valuing others.

In another study from the same article, Stroink and DeCicco found that Aboriginal Canadian culture was associated with metapersonal self-construal while non-Aboriginal Canadian culture was associated with independent self-construal. The authors attribute this to the Aboriginal view of the self as dynamic and interdependent with the environment. They argue the same for other Aboriginal or Native American cultures, giving the example of the Navajo belief that “all entities are understood to consist of certain primary elements, and it is this shared substance that unites human and nonhuman entities” (p. 921). These kinds of Aboriginal belief systems that emphasise shared essence or a small self that is embedded in the natural world would also seem prone to a strong link between an *essential PO* and intrinsically valuing others.

The above examples highlight some specific cultural narratives that would be expected to link intrinsically valuing others to the *essential PO*, in contrast to its primary link with the *expansion PO* expected in contexts that emphasise the self. However, they also highlight a more general issue, namely that the broader self-construal, individualism-collectivism, and east-west conceptualisations miss important nuance that can be gleaned by observing the details of the cultural narratives or belief systems. Combining cultural narratives and belief systems with the nuance offered by the oneness typology would provide
a deeper understanding still. For example, given that the metapersonal self-construal is a
oneness concept that combines expansion and essential POs, one might ask the question: Is
the positive relationship between metapersonal self-construal and, say, universal values based
on expansion or essential POs or both? The above analysis would expect it to be based on
expansion in cultural groups that emphasise the self, and essential in cultural groups that de-
 emphasise the self.

To summarise this section, I do not believe that the link between expansion and
intrinsically valuing others undermines altruism as characterised by intrinsically valuing
others (Batson et al., 1997; Batson, 2011). In a context in which the centrality and intrinsic
value of the self is emphasised, this relationship would be expected, because a sense of
intrinsically valuing others would likely be interpreted using self-related concepts like
expansion, which serve as a heuristic for understanding what it means to deeply value others.
However, this link between expansion and intrinsically valuing others may not hold in
contexts in which the self is de-emphasised or taken to be illusory, such as in Buddhist,
Hindu, and some Aboriginal cultural narratives. In these contexts, a sense of intrinsically
valuing others may be expected to be more closely linked to essential than to expansion POs.

6.2.1 Can interdependence go as deep as expansion and essential?

The above discussion has focussed on how a sense of intrinsically valuing others is
related to only expansion and essential POs. This theme has been carried through the thesis,
alongside the theoretical link between instrumentally valuing others and the interdependence
PO, implying that interdependence does not create as deep a sense of connection as do
expansion and essential. However, interdependence may give rise to a deeper sense of
connection through practises and belief-systems of various indigenous peoples. While the
industrialised world has become disconnected from nature (Schultz, 2002), indigenous
perspectives continue to describe a close connection to the natural environment that sustains
them and that provides the context for their ancestry and cultural stories (Roberts, Norman,
Minhinnick, Wihongi, & Kirkwood, 1995; Stroink & DeCicco, 2011). Their proximity to this
interdependence would be expected to shape their cultural stories and their beliefs and
feelings about how they are connected to the environment in a way that maximises respect
and care towards it, as opposed to just holding beliefs about surface-level interdependence.
As Roberts (1995) noted in her paper on conservation from a Māori perspective, Māori (and many indigenous peoples) conceive of a mutual dependency between all members of the “environmental family”, which includes humans. She notes that “Earth’s bounty is considered to be a gift necessitating reciprocity” (p. 14). The reciprocal relationship involves respecting the gods (five of which are directly related to food) in order to receive food for survival. One way of thinking about this is that the gods are the original Kaitiaki (guardians) of the natural world, and that by respecting them, they will reciprocate Kaitiakitanga (guardianship) over the people (Del Wihongi, in Roberts et al., 1995, p. 14). Roberts further elucidates this interdependence by noting that this “Māori ‘environmental ethic’ and its attendant management practices was thus one of conservation for human use, and rāhui (temporary prohibitions) were intended to ensure the sustainability of the resource for this purpose, and not because of the “sanctity” or “intrinsic value” of the resource concerned” (p. 15). She argues that there is an inherent separation between people and nature that is implied by the concept of nature as sacred, because it makes nature something “out there” to worship and protect. It could be considered a luxury to say that nature has intrinsic value, because it implies a disconnect from how reliant on nature people actually are. That is, when you are living off the land, its ability to provide for you is likely to be more salient than notions of intrinsic value. Interdependence, when *truly* lived, rather than just conceptualised, *becomes* a deep connection.

Indeed, the Māori perspective is that there is no dichotomy, but rather that humans and nature form a “unified whole… by way of reciprocal utilitarianism” (Roberts et al., 1995, p. 16). Although the Māori view is quite strongly interdependent, it is also deeply spiritual, in the sense that the interdependence is between people, aspects of the natural world that are personified as gods, and a life-force that extends back through ancestry to a single source from which the gods also arose (incorporating an element of the *essential PO*). It goes beyond the “resource economics” that is entailed by more western views of interdependence with nature.

This idea that the interdependence with nature central to indigenous peoples’ perspectives creates a particularly strong connection and respect for the natural world is also acknowledged in the deep ecology movement. Roberts (1995) noted that the deep ecology perspective is in the same spirit as the Māori one. Further, Drengson (1995) notes that the deep ecology perspective is most conducive to allying with indigenous perspectives, providing language that can be translated more accurately into (and that can in turn translate)
the concepts central to indigenous perspectives. One of the main notions of the deep ecology perspective is self-realisation, which for humans entails extending our compassion to the wider living world, such that it becomes a part of ourselves and we are able to identify with this larger “Self” (i.e., *expansion*) (Drengson, 1995). Interestingly, the language that best translates the strongly interdependent Māori perspective (and the deep connection that it entails) into language that makes sense in a Western context may well be the *expansion* language central to the deep ecology perspective.

6.3 Thoughts on the typology and its measures

After the factor analyses presented in Chapter 4, the typology and its measures were adjusted slightly such that the experience manifestation no longer distinguished between the three *POs*, and the belief and feelings manifestations were operationally defined as one belief/feeling manifestation. However, there are a number of further possible adjustments that will be considered here.

6.3.1 Scope and middle-ground oneness

The first relates to the scope dimension. One theme that began to develop through the discussion sections in the preceding chapters was that middle-ground scopes might not fit within the concept of oneness as well as the two extremes – the two extremes being close others like offspring or long term romantic partners, and all-encompassing entities like nature/life/all of existence. Oneness connections might form with specific close others because of the nature, frequency, and intensity of the interactions with them (Aron & Aron, 1986; Aron et al., 1991; Aron et al., 1992); and oneness connections might form with all-encompassing entities because of the tendency for oneness experiences to be “boundary dissolving” and therefore to tend towards extending to everything. In other words, the conditions that are conducive to fostering a sense of oneness with humanity (a middle ground between a specific close other and all of existence) may not stop at the level of humanity, and instead may collapse outwards to include everything. There is some evidence for this, as Moreton et al. (2019) found that people who tended to report higher oneness with broad human groups (as opposed to more specific people) also tended to report higher oneness with nature.
However, people do seem to report senses of oneness with specific human groups. W. B. Swann and his colleagues’ work on “identity fusion” (Gómez et al., 2011; Swann et al., 2009; Swann et al., 2012) describes this phenomenon in detail, noting that identity fusion with a particular group like a nation is characterised by a visceral sense of oneness with that group and a belief in the reciprocal strengthening between self and group (an interdependence PO). He notes that this strong connection between self and group can be extended to groups comprised of strangers through concepts such as shared essence (an essential PO). It seems as though identity fusion is a oneness concept that applies to the middle ground.

However, Swann et al.’s identity fusion also highlights an interesting (and problematic) characteristic of middle-ground oneness, namely that it may be prone to fostering ProTs towards one self-transcendent entity at the cost of another with particularly devastating consequences. Indeed, Swann et al. (2012) developed the concept of identity fusion in an attempt to explain extreme pro-ingroup behaviour, like suicide bombing. Further, dehumanising an outgroup is an example of construing an essential difference between ingroup and outgroup, and is a common mechanism by which people justify anti-outgroup behaviour (Struch & Schwartz, 1989). It seems, therefore, that the way oneness plays out in the middle ground might have the tendency to create anti-social tendencies towards one group of people as a counterpart to prosocial tendencies towards another group of people. The question is, should the concept of oneness be broad enough to include oneness connections that create extreme anti-social tendencies towards some people? If not, then what is the principle that demarcates, say, a perception of shared essence that counts as oneness and a perception of shared essence that does not count as oneness? One simple principle that is worth considering is scope. That is, oneness requires an all-encompassing scope, such that it does not create an outgroup towards whom to be anti-social. This reconceptualization would require deleting the scope dimension altogether, as an all-encompassing scope would be implied by the definition. However, it also explains the problem away, and overlooks potentially important and interesting nuance. It is therefore worth considering other solutions, which can take two general forms: different underlying processes, and different outcomes.

**Different underlying processes**

This section explores the possibility that there are two distinct types of middle-ground oneness that are underpinned by different processes. In the discussion on the possible
evolutionary lineage of oneness, two evolutionary scenarios were identified. One acted at the level of groups, in which cohesive groups outcompeted less-cohesive groups (Sober & Wilson, 1999; Swann et al., 2012), making oneness a possible adaptive psychological mechanism that promoted ingroup cohesion. In this scenario, fleeting oneness experiences that were induced in group rituals were argued to bolster this group cohesion further. This scenario is inherently competitive at the level of groups, so it may be most conducive to creating the kind of problematic middle-ground oneness that supports tribalism and extreme anti-outgroup behaviour. However, it is worth noting that just because a process is competitive at the evolutionary scale, it does not necessarily produce the experience of competition at the psychological scale (e.g., Sober & Wilson, 1999).

A similar cause of middle-ground oneness that is conducive to anti-outgroup behaviour can be found in terror management theory (Burke, Martens, & Faucher, 2010; Castano, 2004; Greenberg, Pyszczynski, & Solomon, 1986). The theory holds that the often subconscious fear of death makes people “cling” to their ingroup, simultaneously promoting anti-outgroup attitudes and behaviour because of the threat the outgroup may pose to the self-esteem and worldview provided to them through their ingroup (Burke et al., 2010; Castano, 2004; Greenberg et al., 1990; Rosenblatt, Greenberg, Solomon, Pyszczynski, & Lyon, 1989). To the extent that this identification with the ingroup also contains a component of oneness, its coupling with an increased tendency for out-group hostility makes it another example of problematic middle-ground oneness with a specific underlying cause.

If the fear of death and/or an evolutionary history in inter-group conflict provides the underlying mechanism for all types of psychological oneness, then the position must be defended that cultural norms and narratives are able to co-opt this capacity and turn it into the all-encompassing, seemingly inherently loving form of oneness that also exists. It is not clear, therefore, whether these underpinnings to middle-ground oneness capture enough of the complexities of what oneness can feel like and the wide-reaching ProTs it can promote.

Another evolutionary scenario that was considered in the introduction was in the close parent-offspring bond (e.g., Batson, 2011; Naess & Drengson, 2008; Sober & Wilson, 1999). Human offspring are born relatively under-developed in the sense that we require parental support for longer than any other primate (Alexander, 1990; Dunsworth, Warrener, Deacon, Ellison, & Pontzer, 2012). One of the theorised contributing factors is our extreme sociality, the shaping of which is benefitted by being immersed in a social environment as
early as possible (Alexander, 1990). This dependency on parents, in combination with the drive for socialisation, creates a scenario in which a close bond between parent and offspring is highly adaptive. Oneness may be a psychological manifestation of this close bond.

Indeed, it is not just the parents that would feel oneness with their offspring, but the offspring would also feel oneness with their parents. This has been hypothesised to create what Siegel and Weinberger (1998, p. 72) call the “oneness motive”, which they conceptualise as an often subconscious drive to “become part of, at one with, or belong to, a larger whole” that stems from the oneness they felt with the nurturing and protective mother in early childhood. This desire to nurture and to be nurtured within a oneness connection, stemming from close parent-offspring bonds, appears on the surface to be vastly different from the sense of oneness with the “tribe” out of fear of death or in order to dominate other groups. These two underlying processes may represent a principle for demarcating between what the typology is trying to capture and what it is not trying to capture, regardless of whether it refers to a “middle-ground” scope. That is, feelings of closeness with a group that have an evolutionary lineage of inter-group competition and fear of death may be considered for exclusion from the oneness typology, while feelings of oneness with other entities that has an evolutionary lineage in the close parent-offspring bond, or that constitutes a manifestation of Siegel and Weinberger’s (1998) oneness motive would be included in the oneness typology. This discussion would suggest that middle-ground oneness based on mechanisms that evolved in the context of intergroup competition, and that may be prompted by fear of death, would feel different than middle ground oneness that is based on mechanisms that evolved in the context of close parent-offspring bonds. This is an empirical question that can be reserved for future research to support this hypothesis.

Another potential solution that also differentiates between two types of middle-ground oneness on the basis of two different underlying processes relates to Niki Harré’s (2018) concept of the infinite game. The infinite game is a metaphor that helps to understand the broad motivational forces that play out in people’s lives. According to Harré, the infinite game is played for the sake of keeping the game going – there is no defined set of rules and no winner. Finite games, on the other hand, are played with a clear set of rules, and are played for the sake of winning. Finite games are not bad per se, but they have the potential to be damaging if they are played in a way that detracts from the infinite game. Indeed, finite games may be useful for keeping the infinite game in play, in the same way that an evening card game (a finite game) may facilitate connection with friends (part of the infinite game);
and an economy (a finite game) is useful for distributing necessary resources to a large, dispersed population of people so that they can continue to live and flourish (the infinite game). The infinite game is closely related to oneness, because to have an acute sense of the infinite game is 1) to recognise the intrinsic value in life, and 2) to recognise the potential impact that your actions can have on the infinite game and therefore to recognise the interdependence of everything.

With this in mind, middle-ground oneness that emerges from finite games may be prone to anti-social tendencies, because it has its roots in a drive to win (and therefore to beat others). For example, oneness with your team mates in a competitive sports endeavour may be prone to antisocial attitudes towards the opposing team. On the other hand, middle ground oneness that emerges from the infinite game may not be prone to anti-social behaviours, because it still has its roots in a drive to keep the infinite game in play. For example, a feeling of oneness with your community when you work together to replant native forest. Middle-ground oneness that emerges from being aligned with the infinite game may therefore be a different phenomenon than middle-ground that emerges from being aligned with a given finite game, and this may be a useful demarcation principle for what the typology is and is not trying to capture.

**Different outcomes**

The second type of solution to the problem of which types of middle-ground oneness the typology should distinguish between is to observe the downstream effects of different types of middle-ground oneness. The religious scholar Karen Armstrong (2011, pp. 1-2) argues that, at its core, spirituality is about connecting with the transcendent, whether it be called God or Brahman, etc. The compassion that stems from true spirituality has led to an equivalent of the “Golden Rule” in all faiths, encouraging people to treat others well, regardless of what group they belong to. In other words, if you treat others badly, it does not count as religious or spiritual. Although oneness does not have to be a spiritual phenomenon, (depending on how spirituality is defined) it shares a goal in that it is a way of understanding one’s own existence in the context of an ultimate reality (Gorsuch, 2002, p. 8). It could similarly be argued that if a given case of middle-ground oneness leads to treating some other people badly, that it is not oneness.
The two types of solution to the middle-ground problem, namely different causes and different outcomes, are not mutually exclusive. All other things being equal, oneness stemming from a capacity that evolved in the parent-offspring bond, and/or that is aligned with the infinite game would be the very kind of oneness that is conducive to adhering to the “Golden Rule”, whether or not a given case of oneness happens to extend only to a middle-ground scope.

6.3.2 Psychological ontologies: interacting across different levels

Although the typology allows for all of the three POs to manifest in beliefs or feelings, in reality the POs may tend to relate to these manifestations in different ways. The interdependence PO represents more of a knowledge-based statement of fact about the world. You either know about the ways in which you are part of a system or you do not. If this knowledge is salient then you have a high interdependence PO. However, expansion PO may represent more of an attempt to interpret intuitions and feelings than to be belief based. Do people really believe that they are the ecosystem of which they are a part, or is that just an intuitive way of conceptualising a sense of deep connection? An essential PO on the other hand, can sometimes be more fact based, like knowing that we sharing a common ancestor with all life on Earth, or everything emerging out of the same atomic soup. But it can sometimes also be may be more intuition based, like the sense of shared essence that Dutcher et al. (2007) talk about. It seems, therefore, that interdependence may edge more towards the belief manifestation, expansion more towards the feeling manifestation, and essential somewhere in the middle. This tendency was also mentioned in the initial presentation of the typology, and would be worth exploring in future research.

Another potential refinement to the oneness typology since its initial development is related to the interactions between the three POs. Aron et al. (2004, p. 105) argued that, in close relationships, acting as though one’s partner’s resources are one’s own tends to create, as a by product over time, a sense of including the other in the other in the self. If interdependence eventually creates a sense of expansion for close interpersonal relationships, then perhaps it does so for other scopes as well. Using nature as an example, if one lives in accordance with the belief in their interdependence with nature, then over time this might transform into a sense of inclusion of nature in the self as a more deeply engrained way of producing the same pro-environmental tendencies. In other words, if my welfare depends on
the natural world, and the welfare of the natural world depends on my actions, then this relationship might become so consolidated that the welfares of the two entities become conceptually equivalent rather than just dependent on each other. If this is true, then perhaps the strengthening of (and living in accordance with) beliefs about interdependence through time represents another way of creating a sense of expansion, in addition to the other way explored throughout this thesis (i.e., through oneness experiences). This is related to the discussion of the Māori perspective above, in which the idea was explored that interdependence, when truly lived, becomes a deeper connection.

6.3.3 Can the self-report measures based on the typology replace already existing measures?

The final point I would like to consider here is whether the self-report measures produced in this thesis have the potential to supersede existing measures of oneness in the literature. One general trend that was identified in Chapter 3 was that no existing measure distinguished between the different POs. The measures produced here do distinguish between the POs, so they are a valuable addition to the array of existing measures. However, in order to distinguish between different types of oneness, the measures do not include the more general oneness items, such as those that refer to “a sense of oneness” or the pictorial Inclusion of Other/Nature in Self family of measures (e.g., Aron et al., 1992; Mashek et al., 2007; Schultz, 2002). This is both a strength and a weakness. It is a strength because it has the potentially to provide a more detailed understanding of the relationships between different types of oneness and ProTs. It is a weakness because if a researcher is interested in a more general sense of oneness, then they would benefit from using measures that include some of these more general items with high face validity for general oneness. In cases in which researchers are interested in more general oneness, one option would be to combine the three POs and add some more general items that do not isolate a specific PO (e.g., “I feel a sense of oneness with nature”).
6.4 Limitations and future research

The discussion sections of the preceding chapters pointed to areas for future research where applicable. However, in this section, some areas for future research are discussed for the project as a whole.

6.4.1 Other ProTs

One general area for future research is to test the effects of the oneness typology on other outcomes, whether different ProTs or different psychological phenomena altogether. Regarding ProTs, the concept of ProTs was set up as short hand for the various prosocial and pro-environmental tendencies that oneness measures had been found and would be expected to predict. ProTs exist across multiple domains, including values (Schwartz, 1992; Schwartz, 2012), aspirations (Kasser & Ryan, 1993; Kasser & Ryan, 1996), concern (Schultz, 2001), motivations (Batson, 2011; Singer & Steinbeis, 2009), intrinsically and instrumentally valuing (S. C. G. Thompson & Barton, 1994; Vucetich, Bruskotter, & Nelson, 2015; Winter, 2007), behaviours (Aşkun & Çetin, 2017), attitudes (Milfont & Duckitt, 2010), and emotions (Aknin et al., 2015; Haselhuhn & Mellers, 2005; Kals et al., 1999; Moreton, 2018). The current thesis focussed on measures of intrinsically and instrumentally valuing others, with aspirational and behavioural outcomes. The concept of intrinsically valuing others (and its counterpart of instrumentally valuing others) was chosen partly because it was central to Batson’s (2011) altruism, but also partly because it had been argued to be a deeper type of valuing that more reliably produces aspirations and behaviours (Arnocky et al., 2007; Bragg, 1996; Drengson et al., 2011; Schultz, 2002; S. C. G. Thompson & Barton, 1994; Vucetich et al., 2015).

Schultz’s (2001) environmental concern scale was used to measure intrinsically valuing nature (biospheric concern) and humanity (altruistic concern), and instrumentally valuing nature (altruistic and egoistic concern). Some potential problems with this particular measure were discussed at the end of Chapter 5, but here I will consider limitations to the approach of using intrinsic and instrumental value in general. One is that instrumental value may only be a less reliable producer of downstream ProTs in contexts where the utility of nature can be perceived to be replaced – i.e., contexts in which our interdependence with nature is not fully realised or “lived”. In other words, when interdependence with nature is deeply appreciated, as it is in the Māori perspective, then the idea that its utility could be
replaced would be absurd, and instrumentally valuing nature would be expected to take on a depth similar to intrinsically valuing nature. In these contexts, the distinction between intrinsically and instrumentally valuing may not be useful. Applying this to the three levels of environmental concern, such a perspective would be expected to produce a high score in all three levels. That is, I care about the environment because of the whole system – the animals, plants, other people, and myself.

One direction for future research would be to continue to use the distinction between intrinsically and instrumentally valuing, and to explore the cultural contexts in which they form a salient distinction and produce different effects. Another direction would be to focus on more general values that do not rely on the distinction between intrinsically and instrumentally valuing others but that still capture a high importance placed on helping others and/or the environment. For example, Schwartz’s value dimensions have been previously mapped onto the oneness concept of metapersonal self-construal (Stroink & DeCicco, 2011). Metapersonal self-construal (compared to interdependent and independent self-construals) was uniquely related to the value of universalism, suggesting that for people with higher levels of this more general type of oneness, respecting humanity and nature is a central motivational force in their lives. However, given that the metapersonal self-construal scale does not distinguish between the three POs, it is not clear which POs are responsible for this relationship. This would be an area for future research.

6.4.2 Outcomes other than ProTs

Measures of oneness have also been argued to predict outcomes other than ProTs, such as well-being (Byrd, Lear, & Schwenka, 2000; Garfield et al., 2014; St John & MacDonald, 2007), life satisfaction (Edinger-Schons, 2019) and positive emotions (Mayer, Frantz, Bruehlman-Senecal, & Dolliver, 2009). Future research could test whether all three POs have similar or variable effects on these well-being outcomes. Further, oneness experiences are typically positive, so perhaps the frequency of oneness experiences will predict well-being regardless of the POs that the experiences create or reinforce. Indeed, even a single, strong oneness experience induced by the psychedelic compound psilocybin was found to have significant effects on well-being even 14 months after the experience (Griffiths et al., 2008; Griffiths et al., 2011).
Another potential outcome related to well-being is meaning. In the same study on the effects of psilocybin on mystical experiences and positive life outcomes, participants rated the experience as one of the most personally meaningful and spiritually significant experiences of their lives. However, the items used to measure personal meaning and spiritual significance simply asked how personally meaningful and spiritually significant the experiences were to the participants, which does not give much insight into exactly what personal meaning and spiritual significance “mean”.

Beginning with spiritual significance, on describing the importance of their Oneness Beliefs scale, Garfield et al. (2014, p. 357) adopted Gorsuch’s (2002, p. 8) definition of spirituality in which spirituality entails the “quest for understanding ourselves in relation to an ultimate reality”, noting that therefore “beliefs about the ultimate nature of reality are fundamental to spiritual beliefs”. For an experience to be spiritually significant under this definition, it would have to feel as though the nature of ultimate reality had been revealed, as had your position within it. Indeed, some of the key features of mystical experiences include a sense that the experience reveals objective truths, a sense of unitary consciousness, and a sense of unity with one’s environment (MacLean et al., 2012). This combination would seem conducive to a sense of spiritual significance as it contains both the sense of ultimate reality and the sense of personal connection to it.

This conceptualisation of spiritual significance is closely related to how I understand meaning. Firstly, by meaning, I do not necessarily mean a belief in the notion that life has absolute meaning, but rather a more intuitive sense that one’s life is meaningful. One way of understanding meaning is that it is derived from context, and the wider and more interconnected the context, the greater potential for a sense of meaning (perhaps even feeling as though there is absolute meaning). I think a dictionary makes for a useful analogy in conceptualising this kind of meaning.

Imagine a word in a dictionary. It is defined by other words that are also in the same dictionary, and each of those words is defined by other words, and so on. This means that a dictionary contains a circular, self-supporting network of words, and the meaning of each word is, in a sense, ‘triangulated’ on by placing other words around it. Each word has meaning relative this network of other words. However, when a person understands the meaning of a word, it does not feel as though it only has relative meaning. That is, if there is a rich enough network of words placed around a given word, then that word seems to have
meaning in an absolute sense. The meaning just feels self-evident. If you shrunk a dictionary by removing words, but maintained the rule that each word must be defined by other words in the same dictionary, eventually the network of meaning would begin to break down and the meaning of a word would start to become hard to discern by placing the available words around it. This suggests that the larger and the more interconnected the context, the greater the potential for a sense of meaning. With this in mind, oneness relates to meaning, because oneness is a sense or belief about how one’s own life is interconnected with larger contexts. Oneness provides the context that can give rise to the sense of meaning. When the context is large enough, and is perceived to be an ultimate reality, this sense of meaning would become “spiritually significant”.

This conceptualisation of meaning is similar to the idea that religion provides a broad context conducive to a sense of meaning in life (Chamberlain & Zika, 1988; Zika & Chamberlain, 1992). It is also similar to the idea that meaninglessness can stem from an “existential vacuum” (Auhagen, 2000), as beliefs and feelings about how one is connected to an ultimate reality have the potential to fill such a vacuum. Further, Baumeister (1991, p. 15) noted that meaning involves a “mental representation of possible relationships among things, events, and relationships. Thus, meaning connects things”. Finally, Martela and Steger (2016) proposed a tripartite model of meaning in life consisting of coherence, purpose, and significance. In this model, coherence is defined as making sense of the world and one’s place within it. In elaborating on coherence, Martela and Steger (2016, p. 534) noted that “ever more elaborate models of patterns and predictability can be constructed, eventually building to overarching meaning models that help people make sense of one’s self, the world, and one’s fit within the world”. Similarly, George and Park (2016, p. 207) suggest that meaning frameworks, which Heine, Proulx, and Vohs (2006, p. 90) define as “mental representations of expected relationships among people, places, objects, and ideas”, also contribute to a sense of meaning primarily when they are “consistent and coherent”. The idea that meaning is influenced by understanding how one’s life is connected in a coherent way to a wider existence (i.e., oneness) is consistent with the possibility of a relationship between oneness and meaning. There may be other precursors to a sense of meaning in life (such as being able to link one’s actions and circumstances to a grander narrative or to the pursuit of broad life goals (C. L. Park, 2010)), but if the dictionary analogy is useful, it suggests that oneness should predict a sense of meaning. Future research may wish to explore this possibility.
6.4.3 Experimental design

Another area for future research would be to use more experimental designs. The relationships found in the research presented in Chapter 5 suggested that oneness experiences are a useful way of creating beliefs/feelings about oneness, which then may go on to have effects on ProTs. It was also argued that the language used to interpret these experiences may influence the PO that they create or reinforce, and thereby influence the nature of their effects on ProTs. Linguistic framing of various scenarios can influence how they are perceived and how they affect other outcomes (Nelson, Oxley, & Clawson, 1997). Further, pre-existing beliefs and values have been argued to influence how oneness-type experiences are interpreted (Garfield et al., 2014; Van Cappellen & Saroglou, 2012; Yaden et al., 2017). However, the relationships found in Chapter 5 of the present thesis were not based on an experimental design, so evidence has yet to be found of a causal relationship from oneness experience to oneness beliefs/feelings to ProTs, including whether variation in how the experience is framed influences the content of the oneness beliefs/feelings. An experimental design was attempted in the pilot study (Chapter 2) but with pre-existing oneness measures that did not make the distinctions implied by the typology.

Experimentally inducing oneness experiences, and then manipulating the language used to frame the experience would be the most obvious way of exploring the causality in these relationships. Psychedelic substances represent one way of inducing particularly strong and profound oneness experiences (e.g., Forstmann & Sagioglou, 2017; Griffiths et al., 2006). Imperial College London have their Centre for Psychedelic Research, so these kinds of experiments are within the realm of possibility. Other options would include immersion in natural environments, or possibly re-visiting the eye gaze task from Chapter 2 with a more diverse range of participants than stage one psychology students, and with new strategies to make the setting more conducive to oneness experiences. Further options would include techniques like meditation, which may require using participants that are relatively well practised in the appropriate techniques.

6.4.4 Cross-cultural research

The final and perhaps most important area for future research relates to cross-cultural variation. This has already been addressed above in relation to specific issues. In particular how cultural variation may explain whether intrinsically valuing is related to expansion or
essential P0s (e.g., stereotypically Western cultures or Buddhist cultures respectively), and how in some cultural contexts (e.g., from a Māori perspective) the interdependence PO may be related to a deeper sense of valuing (in this case nature) than in cultural contexts with a history of separation from nature. To avoid repetition, this section will consider three more general ways for cultural factors to influence oneness as conceptualised by the typology. In particular, it will consider 1) cultural variation in the frequency of oneness experiences, and the practices that may underpin this; 2) cultural variation in overall levels of oneness beliefs/feelings, regardless of PO; and 3) cultural variation in the relative endorsement of each PO.

**Oneness experiences**

While oneness experiences might be attainable for everyone, cultures vary in their typical practices and rituals that predispose people to having oneness experiences. Buddhist cultures, for example, might be expected to have a particularly high frequency of oneness experiences through meditation (Z. Chen et al., 2011). The same might be true for cultures with shamanic traditions involving psychodelic plants, like the mescaline-containing cactuses and psilocybin-containing mushrooms in Mexico and the Andean regions; DMT-containing ayahuasca in the Amazon; and ibogaine-containing plants in Africa (Metzner, 1998; Rivier & Lindgren, 1972). Shear (1994, p. 328) argues that “the Western world… had little experience with systematic procedures for producing [mystical experiences]”, until “Eastern meditation techniques (first Zen and Yoga, then Transcendental Meditation)... [were disseminated] throughout the Western world in general”. However, others have argued that oneness is a feature of all religions, and that prayer in the Christian tradition in the west can connect people with this oneness (Beauregard & Paquette, 2006; Hood, Morris, & Watson, 1989; Hood & Williamson, 2000; Moses, 2007; Tarakeshwar, Stanton, & Pargament, 2003). The extent to which cultural variation predicts variation in the frequency and intensity of oneness experiences can be empirically explored further in future research.

**Overall levels of oneness beliefs/feelings**

One way that cultures may be expected to vary on oneness scores in general is through the frequency and intensity of the experiences discussed above. That is, if experiences prompt or reinforce beliefs/feelings, then cultural practices that produce more
frequent and intense oneness experiences would be expected to produce higher levels of oneness beliefs/feelings.

Another is that cultural variation in self-construal might also predispose some groups of people to higher average oneness scores (regardless of PO) compared to other groups. That is, people from cultures that are typically more individualistic may have a tendency to have a higher salience at the individual level (compared to people from typically more collectivist cultures), and therefore a relatively lower salience of any of the three POs at any given time. Further, religion and spirituality can interact with individualism and collectivism, making particular aspects of religion and spirituality more individual-focused or community-focused respectively, thereby influencing the nature of the oneness that religious and spiritual practices may shape (A. B. Cohen & Hill, 2007). These are only a tentative hypotheses, however, as it is noted that there are inconsistencies in the cross-cultural literature on self-construal (e.g., Cross et al., 2011). For example, stereotypically more individualistic cultures may still emphasise particular kinds of collectivism in different contexts (Cross et al., 2000; Cross, Morris, & Gore, 2002; DeCicco & Stroink, 2007; Singelis, 1994; Singelis, Triandis, Bhawuk, & Gelfand, 1995; Triandis & Gelfand, 1998; Vignoles et al., 2016), casting into doubt the idea that individualism-collectivism is a dichotomy (Kagitcibasi, 2005; Vignoles et al., 2016).

Further, it is the Western cultures that are stereotypically more individualistic, yet in the West there is an ever-increasing popularity in various forms of spirituality (Carrette & King, 2004; Houtman & Aupers, 2007; Partridge, 2006), practices such as meditation (Andresen, 2000; Vandana, Vaidyanathan, Saraswathy, Sundaram, & Kumar, 2011; Vohra-Gupta, Russell, & Lo, 2007), and the “psychedelic renaissance” (Sessa, 2012). Therefore one might equally expect relatively high levels of average reported oneness in these cultures, or at least among groups characterised by spiritual or meditative practices within these cultures. Finally, it is also worth noting that more typically collectivist cultures (i.e., those comprised of people with relatively higher interdependent self-construals) would not necessarily be more prone to wide-reaching oneness at the level of humanity or nature, but may be more prone to the types of middle-ground oneness discussed previously. Cultures that would be expected to have wider-reaching oneness would be those comprised of people who have relatively higher levels of metapersonal self-construal, rather than relatively higher levels of interdependent or independent self-construals. Nonetheless, the relative importance placed on the self, the group, and the group in relation to nature would be expected to have important
effects on overall oneness, it is just a question of whether particular cultural groups capture this variation in where the relative importance is placed.

Relative endorsement of the POs

Cultural variation may predispose people to experiences and oneness in general, but it may also influence the relative endorsement of the different POs. The salient language and metaphors that people use to interpret oneness experiences and to conceptualise how they are connected to the world at large would is shaped by different religious stories (e.g., Hood et al., 2001; Yamane, 2000), or variation cultural narratives in general (e.g., Garfield et al., 2014; Garside, 1972). For example, as discussed already, cultures that emphasise the centrality of the self may tend to endorse an expansion PO in their oneness beliefs/feelings; while cultures that de-emphasise the self or emphasise its illusory nature may tend to endorse an essential PO.

The interaction between this kind of cultural variation and the three POs may also influence the relationship with ProTs. For example, while essential language did not predict ProTs in the research presented in Chapter 5, it may have a more important role in predicting ProTs in cultural contexts in which essential language is the primary way of understanding how the self is connected to the world at large. As argued in the discussion for Chapter 5, essential language could be associated in Western contexts with a spirituality that is aimed more at self-help than an outward orientation, which may partly explain the inconsistent results in the literature with respect to the relationship between spirituality and ProTs (Dillon et al., 2003; Oh & Sarkisian, 2011).

Finally, exploring cultural variation in the salient language and metaphors that relate to the three POs is important for applying the oneness typology in cultural settings other than the New Zealand university in the current thesis. That is, descriptions of the three POs, and the items used to measure how strongly they are held, would convey the nature of POs more intuitively if they used culturally specific language and examples.
6.5 Conclusion

There are countless ways to conceptualise how our individual lives are connected to the rest of existence, from the smallest scales to the largest. Exactly how we do so is informed by our experiences and the conceptual filters through which we understand the world. These conceptualisations and their salience have important consequences for how we treat the other life-forms with whom we share our truly remarkable scenario. Conceptualisations of some form of oneness with the world at large are argued to be particularly useful for a disposition towards general prosocial and pro-environmental tendencies (ProTs), and these may be bolstered or even initiated by oneness experiences. However, exactly how to conceptualise oneness as a general psychological phenomenon, such that it captures important variation, had not previously been entirely clear. The oneness typology presented in this thesis has attempted to do this, and it does so successfully, to the extent that it allowed for rich theoretical development, made novel predictions, and was supported statistically in the context of a New Zealand university.

Oneness can refer to fleeting experiences or to enduring beliefs/feelings about how our lives connect to larger contexts, and the two interact in important ways. Even if oneness experiences have, as others have argued, a “common core” (e.g., Z. Chen et al., 2011; Hood, 2006), how they are interpreted appears to have different effects on ProTs. The characteristics of these interpretations can be categorised according to whether they refer to including others in the self (expansion), forming a symbiotic relationship with others (interdependence), or sharing an essence with others (essential), together forming the psychological ontology dimension of the typology. In the context of oneness with nature in the New Zealand university used in this thesis, interpretations that used expansion language were related to a sense that the other has intrinsic value, thereby promoting helpful behaviour; interpretations that used the interdependence language also somewhat promoted helpful behaviour, but not through a sense that the other has intrinsic value; and interpretations that used essential language did not promote helpful behaviour. The variable effects of how oneness connections were conceptualised were found despite each type of conceptualisation having a root in general oneness experiences. This suggests that fostering oneness experiences, in conjunction with interpretations of the experience that emphasise expansion and/or interdependence would be the most conducive application of oneness to the promoting of ProTs.
However, these results and their implications come with an important caveat. Namely, that cultural variation would likely influence the frequency and context of oneness experiences; the cultural narratives that guide the dominant *psychological ontology*; and the ways in which the *psychological ontologies* interact with other cultural factors to influence ProTs. Future research can explore these avenues, with the hope of identifying the appropriate language to use in different contexts, as we move towards the common goal of living well together.
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Appendices

Appendix A

Infinite word cloud

*Appendix A. Infinite word cloud from Harré et al. (2017)*
Appendix B

Drawn eyes
Appendix C

Finite word cloud

Appendix C. Finite word cloud from Harré et al. (2017)
Appendix D

Psychological ontology items from existing scales

Expansion

*Items were coded as referring to a Self-Expansive oneness connection if they represent other as part of or equivalent to the self*

- When I feel very close to someone, it often feel to me like that person is an important part of who I am
- When I establish a close friendship with someone, I usually develop a strong sense of identification with that person
- I am the entire universe beyond time which is me in an ultimate sense
- I am the beings who might descend from me in the distant future who may not have human form
- I have had an experience in which I seemed to go beyond my normal everyday sense of self
- I think one of the most important parts of who I am can be captured by looking at my close friends and understanding who they are
- When I think of myself, I often think of my close friends and family also
- I am all that happened before my lifetime which has in some way influenced me
- I am experiences of all life forms of which I am one

Interdependence

*Items were coded as referring to an Interdependent connection if they referred to relationships being important to the self, or to some kind of interactional relationship between self and other, such that self and other form a greater whole of which the self is a smaller part*

- My close relationships are an important reflection of who I am
- In general, my close relationships are an important part of my self-image
- I think of the natural world as a community to which I belong
- When I think of my life, I imagine myself to be part of a larger cyclical process of living
- I have a deep understanding of how my actions affect the natural world
- I often feel part of the web of life
- 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 (reverse)
- My relationship to nature is an important part of who I am
- I always think about how my actions affect the environment
- Being a part of an ecosystem is an important part of who I am
- In general, being part of the natural world is an important part of my self-image
- It seems to me that humans and the environment are interdependent
- I believe that the well-being of the natural environment can affect my own well-being
- I feel a sense of responsibility and belonging to the universe
- All existence in the universe forms one great unified life system
- The entire cosmos is linked together by complicated and intricate physical laws
- All living beings are connected because they are produced and nourished by the same diverse forces, such as the pull of gravity in the universe, the flow of energy from the sun and the web of life in the natural world
- Like a tree can be part of a forest, I feel embedded within the broader natural world

**Essential**

*Items were coded as referring to an Essential connection if they refer to some kind of shared fundamental property, substance, or essence between self and other.*

- I often feel a kinship with animals and plants
- I feel that all inhabitants of Earth, human, and nonhuman, share a common ‘life force’
- I see myself as part of a larger whole in which everything is connected by a common essence
- The world is not merely around us but within us
- I feel that I have a lot in common with other species
- The earth is my mother
- Ultimately, I am related to trees
- I feel a real sense of kinship with all living things
- There is a unifying force (in the universe) through which all life is brought together in one great whole
- A vital thread of life joins all objects and beings in the universe
- Every living and non-living thing is an expression of the fundamental life-force of the entire cosmos
- All parts of the universe – both living and non-living – are composed of the same fundamental materials
- I feel that on a higher level all of us share a common bond
- I have experienced an awareness of the life or living presence in all things
- I have had an experience in which something greater than myself seemed to absorb me
- I have never had an experience in which I felt myself to be absorbed as one with all things (reverse)
- I have never had an experience in which my own self seemed to merge into something greater (reverse)
- I have had an experience during which my sense of separate identity seemed to dissolve into something greater than itself
- I have had an experience in which I seemed to be deeply connected to everything
- There is a higher plane of consciousness or spirituality that binds all people
- There is a mysterious link, beyond the purely physical, that connects all human beings with each other and with the entire natural world
- My connection to nature and the environment is a part of my spirituality
- I have experienced a freedom from the limitations of my personal self and feeling a unity or bond with what was felt to be greater than my personal self
- I have experienced a sense of fusion of my personal self into a larger whole
## Appendix E

### Item matrix used in exploratory factor analysis, Study 1, Chapter 4

Table E1

Matrix displaying items constructed for each combination of psychological ontology, manifestation, and scope

<table>
<thead>
<tr>
<th>Row</th>
<th>Psychological Ontology</th>
<th>Manifestation</th>
<th>Scope</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>All humans depend on each other, like team mates</td>
<td>I have an intuitive sense that all humans depend on each other, like team mates</td>
<td>Intuition</td>
</tr>
<tr>
<td>2</td>
<td>I am part of a large network of all people on earth</td>
<td>I have an intuitive sense that I am part of a large network of all people on earth</td>
<td>Experience</td>
</tr>
<tr>
<td>3</td>
<td>All people are connected through their interactions with each other</td>
<td>I have an intuitive sense that all people are connected through their interactions with each other</td>
<td>Belief</td>
</tr>
<tr>
<td>4</td>
<td>My well-being depends on the well-being of others</td>
<td>I have an intuitive sense that the well-being of others could affect my own well-being</td>
<td>Nature</td>
</tr>
</tbody>
</table>

**Note:**
- **M:** mean
- **SD:** standard deviation
- **Alpha:** Cronbach’s alpha, of which a score greater than 0.7 indicates good internal reliability
Appendices F1-F6

Parallel analysis scree plots from exploratory factor analyses, Study 1, Chapter 4

**Figure F1.** Parallel analysis scree plot for items referring to belief in oneness with nature. The item pool comprised a range of items for each of the three *psychological ontologies*.

**Figure F2.** Parallel analysis scree plot for items referring to feeling a sense of oneness with nature. The item pool comprised a range of items for each of the three *psychological ontologies*. 
Figure F3. Parallel analysis scree plot for items referring to experiencing a sense of oneness with nature. The item pool comprised a range of items for each of the three *psychological ontologies*.

Figure F4. Parallel analysis scree plot for items referring to belief in oneness with humanity. The item pool comprised a range of items for each of the three *psychological ontologies*.
Figure F5. Parallel analysis scree plot for items referring to feeling a sense of oneness with humanity. The item pool comprised a range of items for each of the three psychological ontologies.

Figure F6. Parallel analysis scree plot for items referring to experiencing a sense of oneness with humanity. The item pool comprised a range of items for each of the three psychological ontologies.