

Article

Understanding Conceptions of ‘Nature’ for Environmental Sustainability: A Case Study in Tāmaki Makaurau Auckland, Aotearoa New Zealand

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Abstract: Empirical research that inductively investigates lay conceptions of ‘nature’ is scarce, despite global environmental narratives around sustainability calling for humans to have harmonious relationships with ‘nature’. This paper presents inductive research that attends to the empirical knowledge gap by exploring how respondents self-reportedly conceive ‘nature’ using Auckland, New Zealand as a case study. Results suggested that conceptions of ‘nature’ within the respondent group are diverse and range across 17 themes. Most commonly, respondents conceived ‘nature’ as being something that neither humans nor human influence or activities are a part of. This finding is consistent with what has been found by previous deductive research approaches to understanding conceptions of ‘nature’. However, this research provides a deeper understanding by identifying that respondents form associations with over 60 ‘aspects’ of ‘nature’. By highlighting the complexity of ‘nature’ from a human perspective and being able to identify significant components of ‘nature’ that people associate with, this study not only provides valuable insight for environmental management in the New Zealand study site, but also has potential to support improved management of human–nature interactions that can have a more targeted impact towards achieving sustainability goals at the global scale.

Keywords: nature; conceptions of nature; human nature relationships; framing nature; environmental sociology; environmental philosophy



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1. Introduction

Secretary-General for the United Nations António Guterres recently made a plea that “our war against nature must stop [. . .] it’s time to make peace with nature” [1]. This powerful statement raises two important and urgent questions. Firstly, what is ‘nature’ and/or what does ‘nature’ mean to people? Secondly, do the organizations and agencies charged with protecting ‘nature’ acknowledge that ‘nature’ may mean different things to different groups of society? Despite the growing consensus since the 1970s within the scientific community that we must protect ‘nature’, the term still lacks clear definition [2].

Over the last decade, multi-disciplinary scholarly literature has debated the origins and meanings of the term ‘nature’ from a philosophical and theoretical stance. For example, conservationists Ducarme and Couvet [3] and political scientist Arias-Maldonado [4] provide useful discussions around the historical conceptions of ‘nature’ and how it has semantically mutated throughout history. However, there is scant literature exploring what the general lay public think ‘nature’ is across various contexts. At the time of writing, there has been little empirical research that has focused on exploring conceptions of ‘nature’

and even less that has sought respondents' reflections on what 'nature' means to them or reported their conceptions of nature in an open-ended context.

Amongst the multi-disciplinary literature, ranging from geography, urban planning, environmental education, and environmental studies, that has investigated what nature means to the lay public, Vining et al. [5] reported on their study which asked participants in the United States of America to list words that came to mind when thinking of 'natural' environments. Their results indicated that participants mostly referenced undisturbed environments, void of human influence, when discussing their understanding of 'nature'. Similarly, but with children, Tillmann et al. [6] undertook research exploring conceptions of 'nature' in Canada. They asked their respondents what comes to mind when they think of 'nature'. Their findings concluded that the general conception children held towards 'nature' excluded humans. The authors highlight that, amongst their child participants, the term 'untouched' was an essential component of the way they conceived 'nature'. Similar results were also produced by Aaron and Witt [7], who asked their child participants what 'nature' is to them and found that they mostly conceived 'nature' as containing natural elements (e.g., trees, plants, animals, flowers), or that it was often referred to as 'the wild' and that it was 'separate from the city'.

Another way to explore conceptions of 'nature' is using imagery. One such study was undertaken by Van den born [8], who investigated the various personal images of 'nature' held by respondents in the Netherlands. This study involved presenting interview participants with ten photos representing varied environments. The results of this study strongly suggested that images depicting environments that contained human influence of some degree were considered 'less natural' (e.g., urbanized sites). However, interestingly when respondents were subsequently asked directly and further probed as to whether humans were part of nature or not, 50% believed humans were still part of nature. Buijs et al. [9], also in the Netherlands, explored images of nature and found that what people recognized as 'nature' varied across cultures (specifically, there were differences between the Dutch and immigrants to the Netherlands). Most Dutch respondents (51%) held views of 'nature' that related to wilderness environments, whilst only 25% of immigrants held this view. Scenes with little evidence of human presence depicted within them and those that showed areas that appeared unmodified by humans were the ones that were mostly considered as portraying 'nature' by both New Zealanders and tourists in studies conducted in New Zealand by Newton et al. [10].

Kempton et al. [11] observed a dualistic view of 'society and nature' e.g., that they were two separate entities, when they explored conceptions of 'nature' in a non-direct way by analyzing ways in which respondents discussed 'nature'-related issues in extensive surveys conducted across the United States of America. Lastly, Hazula-Delay [12] undertook research with participants who had been part of a wilderness camp for 12 days and noted that their conception of 'nature' aligned with something 'out there' e.g., excluding any human involvement. Similarly, this conception was observed through the ways in which participants discussed 'nature' within unstructured interviews.

The findings from the studies discussed above provide interesting insights both into how respondents visualize 'nature' through imagery (Van den born [8], Buijs et al. [9] and Newton et al. [10]) and through researcher-identified themes when respondents discussed 'nature' related topics (Kempton, Boster and Hartley [11] and Hazula-Delay [12]), which points to the fact that most respondents see humans and nature as separate from each other and 'natural' as being something that excludes human intervention. However, only three studies specifically sought and subsequently asked their respondents to reflect on what 'nature' meant to them personally in an open-ended manner (Vining et al. [5] with adults, and Tillmann et al. [6] and Aaron and Witt [7] with children). As a result, to date, most research has been deductive and there is an absence of inductive investigative approaches. A lack of inductive approaches may be limiting the understanding of people's deeper beliefs and associations of nature being identified.

An empirical understanding of individuals' deeper beliefs is considered crucial information for those who seek to understand why some individuals behave in sustainable ways while others do not [13]. The scarcity in research exploring self-reported conceptions of 'nature' leaves a significant knowledge gap given the recognized importance of understanding and altering human-nature interactions to help to address the wicked environmental issues facing planet Earth [14].

Consequently, this paper responds to this identified empirical gap in research on self-reported conceptions of 'nature'. The study presented in this article outlines an exploratory case study of conceptions of 'nature' amongst a sample of 997 respondents from Tāmaki Makaurau (Māori) Auckland, Aotearoa (Māori) New Zealand who participated voluntarily in this study, thus highlighting the importance of more inductive approaches to understanding human–nature relationships both internationally and in New Zealand.

This study is particularly important from an empirical research perspective because it quantifies for the first time the self-reported conceptions of 'nature' from an environmental management position, as opposed to psychological, of which most research on the human-nature relationship originates from (e.g., see Restall and Conrad [15] and Ives et al. [16]).

Furthermore, the knowledge acquired from this study has the potential to prompt further research exploring conceptions of, and associations with 'nature' which could help to inform how the term 'nature' might be used more effectively in environmental management policies and programs. However, this study can provide context-specific insight into conceptions of, and associations with, 'nature' in the Auckland region which may be useful to regional environmental policy and programs, as currently, public agencies and environmental organizations have no insight into what 'nature' means to the Auckland population. Lastly, the insights gained from this study can enrich current empirical knowledge on the complex relationships between humans and 'nature'.

2. Materials and Methods

2.1. Study Location

The Auckland region is home to 1.57 million people, accounting for 32% of the country's population [17]. It is the fastest growing region in New Zealand with a growth rate of 1.9% per annum and is projected to be home to 39% of the national population by 2043 as a result of both domestic and international migration [17]. The region is ethnically diverse, with the largest ethnic groups being European/Pākehā (Pākehā is a Māori term for New Zealanders of European descent or any non-Māori New Zealander), Asian, Pacific Islanders, and Māori, and is considered one of the most ethnically and culturally diverse cities in the world [18]. New Zealand is considered to be a developed country and is categorized as a Western country despite its geographic location and strong Eastern world influences reflected in Mātauranga Māori (Māori worldviews) [19].

2.2. Data Collection

This study utilized qualitative online questionnaires and face-to-face and phone/video interviews. Facebook advertising, mail drops, and approaching people in public places were the key methods utilized to recruit participants. Facebook advertising was conducted by posting invitations to take part in the research to community groups across Auckland. Facebook is an efficient way to engage with members of the population and to harness data [20]. The Facebook advertising feature was employed to target people over 16 years of age who lived within the Auckland region. The invitation to participate in the research was kept as neutral as possible so as not to introduce bias prior to the survey. That is to say, we asked people to give their opinions on "nature-related topics". This approach was an effort to appeal to a broader audience than people who might be only "nature/environmentally inclined". However, we acknowledge that it is difficult to avoid the fact that people who are more engaged with 'nature' would have been more likely to partake in the survey, and therefore there may be a level of sampling bias toward this group of people.

Participants were directed to an online questionnaire that was hosted by Qualtrics™. The host site contained a participant information sheet, consent form, and 37 questions (not all questions were related to this study). Additionally, approximately 1000 pamphlets inviting people to participate in the research were dropped into postal mailboxes randomly selected across the region to ensure that advertising of the research was not biased toward attracting only people who had social media accounts. Pamphlets also included researcher contact details for those participants who could not complete the questionnaire online and wanted a physical copy sent to them with return postage. To maximize the response rate, on completion of the survey participants could go into a draw to win one of four \$50.00NZD shopping vouchers.

Further individual semi-structured interviews were conducted after the online questionnaire. These interviews were carried out for two reasons. The first was to ensure that the responses received through the online questionnaire were representative of any person selected at random to ensure minimization of any sampling biases. The second was to give an opportunity to interrogate and to validate the online questionnaire responses. Potential participants for these interviews ($n = 30$) were approached in public places, e.g., beaches, parks, and markets in the Auckland area. Interviews were conducted on the spot and lasted approximately 20 minutes. When initially approaching potential participants, a conscious effort was made to approach only people who looked over the age of 16 years due to human ethics requirements that prevent the questioning of minors. Once they agreed to participate in the research, participants were asked their age to further ensure that they were over 16 years of age. These interviews were supplemented further by in-depth interviews ($n = 4$). Participants for these interviews were sought via a Facebook advertising post and were given a \$20.00NZD cash voucher for their time. The interviews lasted approximately one hour and were less structured than the previous interviews. The aim of these interviews was to ensure that, even if a participant was interviewed in their own time in their own home (the interviews were conducted over Skype ($n = 3$) and telephone ($n = 1$)) and given as much time as required to respond and to discuss their conceptions of 'nature', no other dominating themes or conceptions would emerge based on this different context. Therefore, these interviews were not conducted to draw new conclusions, but to ensure the data was as robust as possible.

2.3. Sample Group

In total, 997 volunteer participants took part in the online questionnaire ($n = 963$) and interviews ($n = 34$) (the participants either took part in the online questionnaire or interview—not both). If this sample had been a random one from the Auckland region, then this sample would be large enough to reject a hypothesis of zero correlation with a p -value < 0.05 (significance level) and a 90% power provided the true correlation between variables was at least $r = 0.11$. However, because this sample is a convenience sample of volunteers rather than a random sample, it is important to acknowledge that any conclusions about the population must be treated with caution. Gender split across participants was 48% male and 52% female, which is closely representative of the gender split in the region [21]. The target settings for the online questionnaire advertisement had to be altered three quarters of the way through the duration of its publication due to an increased input by female participants. Initially it was set to both genders, but in the last quarter the targeting was changed to target only males. The age of participants was a relatively even spread, with the minimum age of participants being 16 and the eldest being in the 81–90 age group. Age groups were not reflective of the Auckland age split as most age groups were under-represented in the sample group, except the age group 16–20 which was nearly exactly reflective of the Auckland 16–20 break-down [21]. Some ethnicities were over-represented compared to Auckland statistics (e.g., European/Pākehā by 30%, Māori by 2%), and under-represented in others (e.g., Pacific Peoples by 10%, Asian by 15%, MELAA (Middle Eastern, Latin American, African) by 1%) [21]. Therefore, this explorative case study is not ethnically or age representative.

An important limitation with this study that needs to be acknowledged is that there may be a level of response bias towards individuals who have access to the internet and actively engage in social media, given the high response rate to this research by those participants who engaged in an online capacity and undertook the Qualtrics™-based questionnaire.

2.4. Self-Report Measures

To explore the potential variations in conceptions of 'nature', the online survey and interview question specifically asked respondents "please tell me in a few words what you think nature is". We deliberately presented the question in a way that was as open-ended as possible. It was reiterated that there were no right or wrong answers and that it was the participants' subjective ideas and thoughts that were being sought. Participants were given a free response text box on the online questionnaire and were given as much time as needed to explain their responses in the interviews. This question was the first question that participants were asked when engaging in the survey (after initial demographic questions). The question was followed by other questions that related to other areas in our broader study (e.g., seeking conceptions of the participants' 'connections' to 'nature', factors that influence human–nature connections, pro-nature beliefs).

2.5. Content Analysis

The open-ended quality of the survey question seeking conceptions of 'nature' generated a high amount of textual data. Responses were coded and then categorized into 28 non-mutually exclusive categories based on applying content analysis of the data and using a deductive (applying pre-existing codes and categories based on an earlier pilot study) and inductive (developing codes and categories through analysis of the data) approach (Table 1) [22,23]. The 28 categories then were grouped further into 17 overall themes using an inductive approach. All coding of data was undertaken by the lead author and was reviewed by an independent colleague. Any discrepancies were addressed through mutual agreement. Due to the subjectivity of coding, it is impossible to identify all potential codes within a set of open-ended responses. Accordingly, the most effective representation of themes within such a set of responses is to establish the percentage of respondents that referenced each theme. This approach is opposed to any attempt to calculate percentages of overall references (relative frequency) which would require an objective and absolute measurement of all possible references that respondents could make.

2.6. Keyword/Terms Search

Furthermore, to explore the various 'aspects' that are associated with 'nature', we ran a search across all responses to pick up keywords that we then grouped into overall themes (Table 2). The aim was to explore which specific 'aspects' of 'nature' came to mind when participants discussed their conception of 'nature'. The purpose of this approach to provide extra insight into conceptions and to respond to concerns as outlined by Ives et al. [16] that the term 'nature' has often been left undefined in research that explores human–nature connections. In the collation of results, each 'aspect' was given an equal value. Giving each 'aspect' the same value was necessary because the question did not ask respondents to rank these aspects of 'nature' by listing them in order of importance, for example, or by rating how much they felt each aspect was considered to be more 'nature' when compared to the others that they listed. We acknowledge that these associations may only reflect the respondents' thoughts at the time of taking part in the survey and therefore consider these the 'first' aspects that came to mind when respondents discussed their conceptions.

Table 1. Conceptions of ‘nature’. Frequency reflects the percentage of respondents who referenced each theme/category. N.B the total(s) add up to over 100.0 percent because respondents often referenced more than one theme/category.

Themes and Categories	Frequency (%)
1. Nature is something of which neither humans nor human influence or activities are a part	58.1
2. Nature is a personal experience or feeling	38.0
2.1. A feeling	35.2
2.2. An experience	2.8
3. Nature is the outdoors	19.0
4. Nature is a resource	14.5
5. Nature is the environment/surroundings	11.6
6. Nature is everything/whole world/planet	10.3
7. Nature is all living beings/anything growing/anything breathing	9.6
8. Nature is something of which both humans and human influence and activities are a part	6.8
9. Nature is an aesthetic	4.6
10. Nature is biodiversity/ecosystems	3.9
11. Nature is a system/process/force	3.6
12. Nature is vulnerable/damaged	3.2
13. Nature is a personification	2.6
14. Nature is an area/space/landscape that is in a healthy state	2.3
15. Nature is a creation by God/the Divine	2.1
16. Nature is humans but not human activities or influence	1.8
17. Nature is a social construct	0.4
Other (unclear response)	4.7

Table 2. Conceptions of ‘nature’—associations. Frequency reflects the percentage of respondents who referenced each theme/category. N.B the total(s) add up to over 100.0 percent because respondents often referenced more than one theme/category.

Themes and Aspects	Frequency (%)
Theme 1—Flora	57.7
Keyword 1.1.—Plant(s)	17.2
Keyword 1.2.—Tree(s)	12.6
Keyword 1.3.—Flora	6.6
Keyword 1.4.—Forest(s)	5.4
Keyword 1.5.—Bush	4.7
Keyword 1.6.—Green(ery)	4.0
Keyword 1.7.—Garden(s)	2.1
Keyword 1.8.—Park(s)	1.9
Keyword 1.9.—Grass	1.6
Keyword 1.10.—Flower(s)	1.1
Keyword 1.11.—Field(s)	0.2
Keyword 1.12.—Meadow(s)	0.1
Keyword 1.13.—Wood	0.1

Table 2. Cont.

Themes and Aspects	Frequency (%)
Theme 2—Fauna	40.3
Keyword 2.1.—Animal(s)	15.3
Keyword 2.2.—Fauna	6.5
Keyword 2.3.—Bird(s)	4.6
Keyword 2.4.—Insect(s)	4.0
Keyword 2.5.—Wildlife	2.9
Keyword 2.6.—Bee(s)	1.8
Keyword 2.7.—Organism(s)	1.7
Keyword 2.8.—Species	1.4
Keyword 2.9.—Fish	0.9
Keyword 2.10.—Bug(s)	0.5
Keyword 2.11.—Worm(s)	0.2
Keyword 2.12.—Pet(s)	0.2
Keyword 2.13.—Spider(s)	0.2
Theme 3—Hydrological	27.7
Keyword 3.1.—Ocean/sea	9.5
Keyword 3.2.—Water	6.5
Keyword 3.3.—Beach(es)	4.7
Keyword 3.4.—River(s)	2.9
Keyword 3.5.—Lake(s)	2.2
Keyword 3.6.—Stream(s)	0.7
Keyword 3.7.—Waterway(s)	0.7
Keyword 3.8.—Waterfall(s)	0.2
Keyword 3.9.—Harbour(s)	0.1
Keyword 3.10.—Estuary(ies)	0.1
Theme 4—Geological	23.6
Keyword 4.1.—Earth	7.7
Keyword 4.2.—Land	6.5
Keyword 4.3.—Mountain(s)	3.8
Keyword 4.4.—Landscape(s)	2.1
Keyword 4.5.—Rock(s)	1.4
Keyword 4.6.—Soil	0.8
Keyword 4.7.—Ground	0.7
Keyword 4.8.—Hill(s)	0.3
Keyword 4.9.—Geology	0.1
Keyword 4.10.—Island(s)	0.1

Table 2. Cont.

Themes and Aspects	Frequency (%)
Theme 5—Atmospheric	10.7
Keyword 5.1.—Air	5.1
Keyword 5.2.—Weather	2.1
Keyword 5.3.—Sky	1.7
Keyword 5.4.—Rain	0.8
Keyword 5.5.—Wind	0.7
Keyword 5.6.—Cloud	0.2
Keyword 5.7.—Storm	0.1
Theme 6—Space	8.4
Keyword 6.1.—Planet(s)	2.3
Keyword 6.2.—Space	2.2
Keyword 6.3.—Sun	1.6
Keyword 6.4.—Universe	1.5
Keyword 6.5.—Moon	0.4
Keyword 6.6.—Star(s)	0.3
Keyword 6.7.—Cosmos	0.1
Theme 7—Consumable	0.9
Keyword 7.1.—Food(s)	0.5
Keyword 7.2.—Fruit(s)	0.2
Keyword 7.3.—Vegetable(s)	0.2

3. Results

The results of the content analysis exploring conceptions of nature are presented in Table 1, and results of the keyword/terms search exploring associations with nature are presented in Table 2. The results are presented as a whole, and not broken down by age, ethnicity, or gender as we did not find any differences in responses based on demographics. Furthermore, understanding whether there are differences in conceptions of ‘nature’ due to age, ethnicity, or gender was not the aim of this study, hence why statistically representative samples of ethnicity or age were not sought.

Firstly, Table 1 shows that 17 non-mutually exclusive themes of conceptions of ‘nature’ were identified as being referenced by the respondents in the study. In some instances, the theme is presented as a collective of categories to display the diversity within the theme.

The dominant respondent conception of ‘nature’ is that ‘nature’ is something of which neither humans nor human influence nor activities are a part (58.1%). Conversely, only 6.8% of respondents had the opposing view, that ‘nature’ is something of which neither humans nor human influence or activities are a part of. The theme that ‘nature’ is a personal experience or feeling was referenced by 38% of respondents. The theme that ‘nature’ is the outdoors was referenced by 19% of respondents and lastly, was ‘nature’ being conceived as a resource by 14.5% of respondents. The remaining themes are further outlined in Table 1. The focus of this paper will be on themes 1–8 (themes that were referenced by at least 5% of respondents).

Secondly, keywords that respondents identified as ‘aspects’ most associated with ‘nature’ were counted and grouped into overall themes, as shown in Table 2. The aspects of ‘nature’ most referenced were those within the theme ‘flora’ (57.7%) and ‘fauna’ (40.3%). Other references to ‘aspects’ of nature could be more broadly fitted within themes labelled as hydrological, geological, atmospheric, space, and consumables.

4. Discussion

The aim of this case study was to address an empirical gap in knowledge, both regionally and internationally, by exploring self-reported conceptions of 'nature' with volunteer respondents in Auckland, New Zealand using an inductive approach. Through doing this, it is hoped that this study prompts future research exploring conceptions of 'nature' to explore the application of findings to more practical environmental management policy, planning and programs. Despite this study being an exploratory case study, it still provides useful insights relating to the Auckland context and could inform some policy, planning, and programs in the region.

Overall, the results of the survey display a considerable diversity of responses relating to how 'nature' is conceived by the respondent group. The way in which 'nature' was described by respondents ranged across 17 themes and 28 categories. What respondents associated with 'nature' ranged over seven themes which contained a total of 63 aspects. The diversity of conceptions across the respondents highlights the potential issue with using the term 'nature' both in practice or research without further qualification because it may mean different things to different individuals and/or groups. To ensure brevity, the remaining discussion will focus on themes that were referenced by over 5% of respondents.

4.1. Conceptions of 'Nature'

Despite there being a range of conceptions of 'nature' identified in the survey, half of the respondents referenced theme one, which categorizes 'nature' as being something of which neither humans, nor human influence or activities, are a part of. Responses allocated to this category included comments such as "nature is anything that humans have not touched", "nature is anything that is not human", "nature is anything that has not been created by humans", and so on. Comments such as these indicate that amongst respondents there is a conceived separation between humans and 'nature'. This dominating conception was expected given that previous more deductive studies outlined in the introduction demonstrated similar findings [5–12]. However, this study revealed greater depth in terms of what people conceive nature to be by also identifying other significant themes of conceptions of nature which will be further discussed.

The second most dominant theme referenced by respondents was that 'nature' is a feeling and/or experience. Examples of the types of responses that were encompassed in this theme include responses such as "nature is calmness" (feeling), "nature is peaceful" (feeling), "nature is camping and trekking" (experience). It is important to note here that all responses under this theme referenced positive feelings and experiences only (as opposed to negative feelings and experiences). This result is not surprising because there is extensive research highlighting the benefits of exposure to 'nature' for health and wellbeing (see a systematic review of literature by Twohig-Bennett and Jones [24]). The common view amongst respondents who had their responses categorized within this theme was that 'nature' evokes a feeling aligned with forms of peace or calmness. This observation is consistent with previous research that has demonstrated that exposure to 'nature' alleviates stress-related conditions (e.g., Berman et al. [25], Biel and Hanes [26]). Why 'nature' is conceived as feelings of peace or calmness to respondents may be due to reasons expressed in the theory of biophilia [27]. Biophilia postulates that humans have affinitive, innate connections to 'nature' which result from the human brain evolving intertwined with 'nature'. Fundamental to this theory is that humans are still attracted to 'nature' (over urban/manmade environments) and being in 'nature' provides a sense of refuge [27]. Given the conceptions found in this study, 'nature' being conceived as positive feelings (namely 'peace', 'calmness', etc.) reflects the overlap between environmental sustainability and psychological disciplines and warrants further research as to how 'nature' exposure potentially could be used as a method of stress-reduction.

The remaining themes, e.g., 3–17, were referenced by less than 20% of respondents but still provide interesting insights into the other types of conceptions that respondents have of 'nature'. The conception shared by 19% of respondents that 'nature' is the outdoors is

consistent with research by Hazula-Delay [12], who found when exploring conceptions of 'nature' that a common conception shared across their respondents was that 'nature' is 'out there'. Furthermore, the conception that the 'outdoors' is 'nature', along with interchangeable use of the two terms, is common across human-nature relationship literature (e.g., most recently, Harju et al. [28], Sachs [29], White et al. [30], Meredith et al. [31]). This conception further explains the popularity of concepts such as biophilic design, the aim of which is bringing outdoor elements inside [32]. A noted limitation here is that we are unsure if respondents intended the term 'outdoors' to encompass everything (e.g., including human-made outdoor environments) or only the non-human aspects of the outdoors. The potential benefit of this conception is that any communications to protect and to enhance the outdoors could be understood by this respondent group as protecting and enhancing anything outdoors and thus may result in a broad view of what 'nature' encompasses (e.g., all plants, animals, water bodies, etc.).

The conception that 'nature' is a resource was shared by 14.5% of respondents. This result is aligned with a finding from another aspect of our broader study [33] where we explored the same respondents' conceptualizations of their 'connections to nature'. The findings from this study showed that 4.3% of respondents referenced a 'connection to nature' as being a material connection (e.g., 'nature' has material value through the resources/services 'it' provides) [33]. This perspective implies anthropocentric values and the associated belief that 'nature' exists to meet human ends [34,35]. From an environmental sustainability perspective, this conception logically should be a powerful motivation for pro-environmental attitudes, as humans can see the direct benefit to themselves if they behave in ways to protect and enhance 'nature' [36].

Themes five, six and seven are difficult to analyze because we are unsure if respondents referencing themes such as 'nature' is 'the environment/surroundings' (11.6%), 'nature' is 'everything/whole world/planet' (10.3%), or 'nature' is 'all living beings/anything growing/anything breathing' (9.6%) were intending to mean that these concepts include humans and/or human activities and influences. Whether humans were included or not has the potential to change the results in Table 1 (although not to the extent that it would have impacted the key findings of the study and direction of the discussion). Given the ambiguity associated with these themes, it would have been useful to undertake further analysis by probing respondents in more detail to help to understand more specifically what these responses were meant to entail. However, the conception that 'nature is the environment' is somewhat expected as the term 'environment' is often used by agencies in the study location when referring to 'nature' or the 'natural environment' (e.g., Auckland Council [37]). Given that the term 'environment' has no global commonly agreed definition [38], comparable questions pertaining to how the lay public conceives the 'environment' can be raised at this point. Exploring the term 'environment' using similar methodologies to this study could be useful to help to clarify what is understood by this term and the differences people conceive between the two terms 'nature' and the 'environment'.

Theme eight categorizes the conception of 'nature as being something of which humans and human influence and activities are a part' (6.8%). Individuals who view themselves or their community as part of nature are less likely to harm 'nature', as harming 'nature' is in effect harming themselves [39]. Results from another aspect of our broader study [40] supported this theorization. The results suggested that respondents who viewed themselves as interconnected with nature (18.7%) (utilizing the Inclusion of Nature in Self scale developed by Schultz [41]) were more likely to hold pro-nature beliefs. This conception potentially offers the most benefit for environmental sustainability outcomes. Therefore, it would be advantageous for environmental sustainability practitioners to work towards trying to encourage individuals toward a conception that 'nature' encompasses both humans and human influence and activities.

Each of the remaining nine themes were referenced by less than 5% of respondents. Examples include that 'nature' is an aesthetic (4.6%), e.g., "'nature' is beauty"; 'nature' is biodiversity/ecosystems (3.9%); 'nature' is a system/process/force (3.6%); 'nature' is

vulnerable/damaged (3.2%); 'nature' is a personification (2.9%), e.g., "'nature' is my mother"; 'nature' is an area/space/landscape that is in a healthy state (2.3%), e.g., "'nature' is an area that is healthy and free of pollution"; 'nature' is a creation by God/the Divine (2.1%); 'nature' is humans, but not human activities/influence (1.8%), and lastly, that 'nature' is a social construct (0.4%). The emergence of these smaller themes suggests that further targeted research into these areas is warranted, and that future research could build on smaller identified themes. As an example, questions emerge around why only 2.1% of respondents conceive 'nature' as a creation by God/the Divine yet 38.4% of Aucklanders [21] identify as Christian in some form. Given that Christian denominations postulate God as being the creator of 'nature' [42], a deeper exploration could shed light on this discrepancy.

4.2. Associations with 'Nature'

As well as understanding the dominant conceptions of 'nature', this study explored what 'aspects' respondents most associated with 'nature' (Table 2). The terms flora (57.8%) or fauna (37.2%) and keywords relating to these categories were the most referenced associations that people had with 'nature'. However, there were 37 other aspects of 'nature' that people identified, which highlights the risk of sustainability practitioners, researchers and policy makers focusing on only some of aspects of 'nature' and not focusing on others. Arguably focusing sustainability efforts on narrow associations of 'nature' may have long term implications for environmental management. These implications include the fact that treating 'nature' as quite specific elements (e.g., in this case, flora and fauna) could adversely affect human efforts to protect some elements of 'nature' that are outside of these categories. It potentially causes a situation where some things can be considered as being more 'nature' than others, leading to some aspects of 'nature' receiving more conservation and protection attention than others.

The findings that help to understand associations with 'nature' are useful for both future environmental sustainability empirical research and practice. For example, Ives et al. [16] argue that the term 'nature' is often left undefined in research exploring human-nature connections, which can be a major limitation as this results in little clarity as to what specifically people are connected to. Our findings demonstrate the importance for any research exploring conceptions of 'nature' to try to determine at the outset what respondents consider to be 'nature' because their conceptions of 'nature' might vary with study groups. Doing so can result in more specificity and targeted research that can draw stronger conclusions around which aspects of 'nature' are the ones to which respondents are connected or not. Furthermore, we strongly suggest that future research from an environmental sustainability perspective continues to expand upon these ideas through exploring why respondents associate some 'aspects' with 'nature' and not others. For example, one avenue of future research could be whether communications by public agencies, organizations, or media sources influence the public's conceptions of 'nature'. Other research could focus on whether where people live influences these conceptions and associations (e.g., whether predominantly coastal communities are more likely to associate coastal related aspects with 'nature' versus others). Furthermore, as mentioned in the methods section, we acknowledge that the reported aspects that respondent associate with 'nature' could merely reflect the first aspects that came to mind when partaking in the survey, and thus may not be the only aspects the respondent associates with 'nature'. We would strongly suggest that future research clarifies this with respondents, which could be done through employing a scale whereby respondents can rank each aspect they associate with 'nature' in order of perceived prominence.

Due to the number of themes and categories relating to the conception of 'nature' and the range of associations respondents have identified relating to 'nature', the results highlight that it is important to consider 'nature' within a broad context. Narrowly conceptualizing 'nature' may fail to encompass all aspects that are important to a population. It is also important to recognize that use of the term 'nature' in conservation and sustainability

programs could have different connotations for different social groups, which could result in a fragmentation as to how the population responds to 'nature'-related communications, campaigns, and legislation. One way to address this issue could be by avoiding the term and instead by referring to the specific phenomena at issue. For example, in the context of conservation, preservation, or protection, such terms could include (hypothetically) 'conserving plant species', 'protecting our landscape', or 'rivers are facing significant pressures'. However, future research could provide deeper insight into these associations at a more detailed level. As an example, when respondents reference 'birds', questions are raised as to whether they are referring to all birds, native birds, or exotic species. If studies such as this are replicated in other contexts, we suggest prompting respondents to discuss which specific species they are thinking of to draw further conclusive findings around potentially varying perceptions of whether only native species are considered 'nature', or not (hypothetically).

4.3. 'Nature' Is Not Humans and/or Human Activities or Influences

It is worrying from an environmental management perspective that over half of the respondents in this study held the conception that 'nature' is something that neither humans nor human influence or activities are a part of, given that numerous authors have argued that the conceived separation between humans and 'nature' is a significant contributing factor towards current ecological problems facing life on Earth [5,43–45]. Although we did not further interrogate respondents' reasoning behind why they conceived neither humans nor human influence or activities as not being part of 'nature', we argue that it would be hard to doubt the strong influence that historical and contemporary culture has on the way that individuals conceive 'nature' [46]. For example, the perspective that humans are not part of 'nature' in contemporary times has been argued to be a result of historical narratives, belief systems, and discourses that are a specific product of the cultural history of the West by a number of scholars and thinkers [44,47–51]. Specifically, White [51] argues that present day humans are "deeply conditioned by beliefs about our nature and destiny, that is, by [historical] perspectives". These historical conceptions of 'nature' are dominated by the conception that 'nature' is something separate from humans and is subject to human use, exploitation, and dominance [52,53]. Other authors, such as Seaman [54], Barber [55], and Bauckham [56], postulate that this conceived separateness between humans and 'nature' is due to the historical Judeo-Christian belief systems that depicted humanity as positioned separate from and superior to 'nature,' which influenced the conceptions of 'nature' across early Western civilizations and still have some influence on contemporary conceptions. The historical perspectives are argued to be accentuated further through current Western mechanistic perspectives [44], which divide issues we face into being either social, environmental, or economic [57,58]. The perspectives that treat 'nature' increasingly as a separate entity (of which the economy, society, and culture are not a part) are contributing constantly towards a mental disconnect between economic growth and its detrimental impacts on 'nature' [59]. Conversely, non-Western conceptions, such as those of Indian, Chinese, and Japanese cultures, can be very different in their outlooks and customs [60]. In contrast to the Western conceptions of 'nature', Callicott and Ames [61] categorize non-Western perspectives as being 'holistic' inasmuch as humans are seen as being part of 'nature'. Although this study showed no significant associations between response and cultural affiliation in New Zealand, Māori (the indigenous population) have long been recognized as having an interconnected and holistic relationship with 'nature' [62]. Māori have unique, historical connections to 'nature' that are deeply rooted in spirituality [63]. Māori acknowledge themselves as tangata whenua (people of the land) and thus consider themselves to be part of 'nature' [63]. This view is similar to the perspectives documented by many of the indigenous people in the Oceania region [64]. Given that New Zealand is considered a Western country with strong Western values and belief systems which were prompted by the process of colonization, and given that European/NZ Pākehā were over-represented in the study (as discussed in the methods section) [65,66], it is

not surprising that this dominant conception by respondents was recorded. Māori were under-represented in this study and therefore having more statistically reflective input by Māori respondents in this study may alter the overall findings and highlight discrepancies between cultural conceptions.

This conception that ‘nature’ is something of which neither humans, nor human influence or activities, are a part which was evident in this study, has attracted interest from within the field of ecopsychology. For example, ecopsychologists Fox [67], Roszak [68] and Metzner [69] label modern mental disconnects between humans and ‘nature’ as a form of ecological unconsciousness. Furthermore, Metzner [70] argues that there is a psyche within the Western culture that is characterized by a dissociative split between spirit and nature or psychic alienation from the natural world. Ecopsychology is described as a discipline that “bridges our culture’s long-standing, historical gulf between the psychological and the ecological . . . ” [68] the goal being to “heal the fundamental alienation between the person and nature” [68]. Therefore, if applied more widely to environmental sustainability, ecopsychology theories could offer a potential opportunity to understand better and to work towards solutions to the dualistic perspectives that were reported in this study. To address these dualistic perspectives, it would be useful for environmental management practitioners to work alongside disciplines such as ecopsychology to help remove the conceived divide between humans and human activities and ‘nature’. Addressing this divide is arguably of the utmost importance in the study region because the rate of urbanization and human influence and activity is increasing rapidly through urban sprawl [71], which is resulting in fewer areas that would be considered free from humans and human influence. If this trajectory continues, a consequential impact could be that ‘nature’, as viewed by over half of the respondents in this study, will no longer exist in Auckland. This prospect has serious implications for environmental management efforts but also could have health and wellbeing impacts for the population given the fact that there is widespread research highlighting the beneficial human health and wellbeing impacts of ‘nature’ (as outlined in the meta-analysis of 143 studies undertaken by Twohig-Bennett and Jones [24]). Therefore, it is important to consider the human–‘nature’ relationship from an interdisciplinary perspective to be able to address sustainability issues.

This study was part of a broader research project exploring the relationship between humans and nature. This finding indicating that humans and nature are separate from one another is consistent with the findings from our other study [40], whereby the majority of respondents (the same respondents who took part in this study) indicated that, despite feeling some level of connectedness with nature, they viewed an overall distinction between themselves and nature. Furthermore, given the perceived separation between humans and nature as indicated by this respondent group, further research was conducted to understand how respondents subsequently enacted their ‘connections’ to nature. Similarly, we further explored what influenced these connections. Therefore, the findings from this study provided a foundation for the remainder of our research project exploring connections between humans and nature.

4.4. Methodological Limitations

This study provides valuable new insight into human conceptions of nature however it is acknowledged that due to time restraints, some themes would have benefited from deeper analysis and respondent interrogation (e.g., themes five, six, and seven and the smaller themes identified that were referenced by less than 5% of respondents). It is important to recognize that the wording of the question asked of respondents (“please tell me in a few words what you think nature is”) may itself have had different meanings across respondents. For example, respondents may have been unsure if the question was seeking what they believe the definition of the word ‘nature’ is or whether it was seeking what ‘nature’ means to them personally.

Furthermore, we are unsure if the aspects that respondents associated with ‘nature’ were the only aspects they associate. Respondents may have also answered differently

to this survey based on context, e.g., being outdoors versus being inside, being at the beach or being in the forest. We acknowledge that this study was undertaken with a predominantly European population (as outlined in the methods) and therefore could have produced entirely different findings if it was undertaken in another location with other cultures. Despite an analysis to test whether varying demographics responded differently regarding conceptions of, or associations with 'nature' finding no difference, this is purely speculative and not conclusive given that this study did not have statistically reflective representations of ethnicities and age groups from the Auckland region. If statistically representative demographic responses were captured, more conclusive findings could have been produced and thus this would be recommended for future research.

Lastly, it is important to acknowledge that there may be various levels of response bias in self-reporting questionnaires, particularly as it is difficult to avoid not targeting specifically those who have an interest in 'nature'-based topics. Therefore, the findings from this study are to be treated as suggestive and speculative, but could be followed on by further research employing different wording of the questions and in different contexts.

4.5. Next Steps

Simberloff [72] argues that 'nature' is at risk of becoming a meaningless panchreston, specifically "a term that means so many different things to different people that it is useless as a theoretical framework or explanatory device". Taking this into consideration, it is important to acknowledge that, although there are some dominant conceptions of 'nature' as highlighted by this study, there may be no universal conception of 'nature'. Therefore, understanding and acknowledging dominating conceptions of 'nature' is important because whoever determines the ruling narratives about 'nature' will potentially determine how society manages 'nature' [73]. The ruling narrative around 'nature' can perpetuate itself by continuing to shape and reinforce the ongoing conceptions and subsequent treatment of 'nature'. As illustrated by the responses in this study, respondents hold various conceptions of 'nature'. The dominant ones are recognized widely but other conceptions and associations that may result from respondents' experiences with 'nature' or personal relationships with 'nature' are an important consideration for sustainability research. These experiences and relationships might be paramount in determining how people behave towards 'nature' and the value that 'nature' holds in their lives. Therefore, we strongly encourage further research that gives consideration more directly to how knowledge of conceptions of and associations with 'nature' could be applied more practically in terms of education, practice, policy, and planning for more effective environmental management outcomes.

The findings highlight that there is a diversity in conceptions of, and associations with 'nature' amongst the Auckland population. Therefore environmental management policy, planning, communications, and research in the region should consider encompassing the full spectra of conceptions and associations evident. Without doing this, the findings from this study suggest that there may be fragmented understandings of what the term is meant to entail, and ultimately may have an impact on the practical outcomes of environmental management agendas. Furthermore, given that the dominating perspectives in the study region see humans and human influence and activities as not being a part of 'nature' and that 'nature' is something specific, e.g., mostly flora and fauna, there is a conceived disconnect in Auckland between people and 'nature', which may result in people not making the link between harming 'nature' and the subsequent impact it will have on themselves or their community [39,41]. Identifying very specific associations with 'nature' that are separate from people can result in narrow borders being constructed around certain elements of 'nature' that are considered more 'natural' than others. The outcome of this type of approach is that programs that aim to address 'nature' in its broadest sense may fail because there is a potential disconnect between what the term is intended to mean and how it is received.

5. Conclusions

Findings from this study provide insight into the dominant conceptions of ‘nature’ across the respondent group (and potentially the region) which can contribute to addressing a gap in environmental management literature both in New Zealand, where no empirical research such as this study has taken place, and internationally, where empirical research is scarce. Furthermore, despite this study being an exploratory case study, the findings suggest that it may be beneficial for environmental management practitioners to consider a potentially broad range of conceptions of ‘nature’ in projects, policy, and planning. Although our findings suggest that conceptions are dominated by a few primary conceptualizations, the variation in responses revealed from self-reported investigation highlights that understanding ‘nature’ in its entirety is complex, that ‘nature’ can encompass several different aspects and can be conceptualized in several different ways. Future research could further explore how these conceptualizations could be applied in practice to environmental management projects, policy, and planning.

Kurethadam [74] argues that the conceptual root causes of current ecological crises occurring across the world are the philosophical arguments around humans’ place in ‘nature’. Therefore, the burden rests on sustainability scientists, environmental managers, ecologists, and conservationists to work across disciplines to help to shift these perspectives. Otherwise, without a new set of values, we could see a worsening of the ecological crisis that threatens our life on Earth [51,75]. This shift in perspectives must include closing the gap between ‘nature’ and humans to achieve a more interconnected and holistic perspective. To address this, we recommend that more empirical research be undertaken using inductive approaches to explore conceptions of ‘nature’ among the lay public in various contexts, so that diverse conceptions can be explored in greater depth. We suggest that future research also should attempt to understand the drivers of contemporary conceptions of ‘nature’, ideally seeking reflection from survey respondents as to what they feel influenced their conceptualizations. Beyond the research, environmental managers are suggested to challenge the dominating conceptions that see humans and human influence/activities as not a part of ‘nature’ and to encourage people towards a more interconnected view of humans and ‘nature’. Alongside this, environmental management practitioners should consider that the issues facing the conservation and protection of vulnerable species and habitats on Earth may arise from narrow definitions and conceptions of ‘nature’ which views ‘nature’ as certain aspects and not others, and that ‘nature’ is something separate from humans, further perpetuating the divide that is argued to be the main driver behind the ecological crises facing the world today [5,43–45]. Thus, focusing efforts on educating the lay population toward a more interconnected view of ‘nature’ may be key to a flourishing planet Earth.

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