A Human Rights Approach To Climate Change:

Examining The Relationship Between Support for Human Rights and Belief in

Climate Change

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Abstract

Climate change impacts human rights, and Māori and other indigenous communities around the world are amongst those most vulnerable to its consequences. This has led the United Nations to recommend a human rights-based approach to climate action. However, no research has examined the relations between support for human rights and climate change beliefs, which is critical if such a rights-based approach is to receive widespread public backing. Here we[1] investigate the cross-sectional and longitudinal relations between support for human rights and climate change beliefs/concern with data from the New Zealand Attitudes and Values Study ($N \approx 17{,}656$) using a combination of variable- and person-centred analyses. Cross-lagged results indicate support for the item regarding physical human rights had a more reliable bidirectional, longitudinal relationship with climate change beliefs/concern, compared to the item regarding economic human rights. A latent profile analysis revealed six distinct subgroups of New Zealanders, with climate change beliefs/concern differing between subgroups but with human rights support being consistently high. Lastly, latent transition analysis revealed that all but one of the subgroups were relatively unstable across the one-year period, but New Zealanders tended to move from profiles of lower climate beliefs/concern into profiles of higher climate beliefs/concern. Findings reveal novel implications for a rights-based climate change response.

Keywords: climate change, human rights, attitudes, beliefs, concern, NZAVS, United Nations, Māori, New Zealand

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[1] Although this thesis is my own work, I use the term 'we' to reflect the advice and guidance I received from my supervisor and other academics.

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Introduction

Climate change is an ongoing, pervasive threat to the livelihood of the global population. The effects of climate change will prevent several human rights from being met, including the right to health, water, food, and life (Office of the High Commissioner for Human Rights [OHCHR], 2015). It will also have an unequal impact on populations across the globe, affecting more third-world countries and poorer communities than first-world countries and rich communities (Intergovernmental Panel on Climate Change [IPCC], 2014). Thus, it is important to find effective collective action to avert climate change and avoid climate-induced human rights violations. Indeed, the United Nations (UN) argues that climate change action should be human rights-based, in which responsibility is placed on governments to address the human rights violations of climate change (OHCHR, 2015). A rights-based response would have the benefit of protecting vulnerable populations while also making the consequences of climate change more concrete and easier to prioritise in the legal system (Bodansky, 2010). However, despite having many potential benefits, we do not know whether a rights-based response would gain support from the widespread public. To begin to understand whether a rights-based response would gain public support, we turn to the public attitudes surrounding human rights and climate change.

Public attitudes provide a good indicator of whether a policy will be supported by the public, and whether the policy itself will be successful. Prior research has found that public opinion influences government policy responsiveness (e.g., Page & Shapiro, 1983). In other words, governments are more likely to develop stronger policies, and advance these policies, in response to public opinions. In the context of climate change, research has found that climate change beliefs, and knowledge of climate change, are associated with support for climate policies and with individual pro-environmental behaviour (Bord et al., 2000; Sibley & Kurz, 2013). Another study provided convincing support for the importance of public

opinion by quantifying the impact of public attitudes on climate mitigation strategies across 26 countries (Tjernström & Tietenberg, 2008). Results indicate that a one percentage point increase of people in a country who believe that climate change is an important issue is associated with a .49 percentage point reduction in greenhouse gas emissions. Together these studies show that public attitudes are related to support for policies and that public support aids in the successful development and implementation of policies. Thus, before implementing a rights-based response, we must first understand public attitudes surrounding the response strategy; that is, public attitudes around human rights and public beliefs around climate change.

However, to our knowledge, no studies have examined the relationship between human rights attitudes and climate change beliefs formally. To address this gap in the literature, the present research uses national and longitudinal data to examine whether human rights support and climate change beliefs (including climate change concern) are predictive of each other longitudinally, whether there are subgroups in the population who have distinct human rights and climate change response patterns, and whether these subgroups are stable over time. This research will allow us to better understand whether a rights-based climate response strategy will be supported—and by whom. To begin to understand this relationship, it is useful to draw on the literatures that separately have dealt with the social-psychological and demographic predictors of human rights and climate change attitudes.

Social-Psychological and Demographic Predictors of Attitudes Towards Human Rights

Attitudes towards human rights are conceptualised in many different ways across the literature. Prior studies have measured attitudes such as endorsement/agreement with human rights, commitment to human rights, enforcement of human rights, and restriction of human rights (Cohrs et al., 2007; Diaz-Veizades et al., 1995; Grace & Van Velzer, 1951; McFarland & Mathews, 2005; Moghaddam & Vuksanovic, 1990). Although the different attitudes of

human rights are correlated, they also have different relationships with predictor variables (Cohrs et al., 2007; McFarland & Mathews, 2005). Here, we primarily focus on 'support' for human rights, which refers to an agreement with or endorsement of human rights. We also include limited discussion of commitment to and restriction of human rights.

To add further complexity to the interpretation of this literature, there are a broad range of methods that are used to measure attitudes towards human rights. Some studies measure human rights attitudes with singular human rights items (Barrows et al., 1981; Holsti, 1996), whereas others use scales to measure attitudes towards human rights. (Cohrs et al., 2007; Crowson & DeBacker, 2008; Diaz-Veizades et al., 1995; McFarland & Mathews, 2005). Depending on the scale used, human rights attitudes may be reported as a singular attitudinal factor (i.e., human rights as a general concept) or as distinct domains of human rights factors (for example, human rights regarding equality or social security) (Crowson, 2004). In this review, we do not limit studies to a specific methodology. Instead, we discuss findings according to the scale (or the lack thereof) used in the study.

Despite these complexities in interpreting the literature, research has found that, overall, support for human rights is high cross-culturally (for a review on cross-cultural differences of human rights support, see McFarland, 2015). There are, however, differences in the strength of support for certain human rights across countries. For example, results of a World Public Opinion survey examining the attitudes towards human rights across 25 nations, with a sample size of over 47,000 participants across two waves, showed that 76% of United States citizens believed that it is very important to have the right to freedom of expression. In contrast, only 48% of respondents in India rated this right as 'very important'. Cross-cultural differences in support for human rights such as this are influenced by country-specific factors such as political instability, and events that put citizens at risk such as terrorism (Worldpublicopinion.org). Cross-cultural differences in human rights are also

influenced by differences in cultural values and political traditions (for example, communitarian vs individualistic countries) (McFarland, 2015).

Along with differences between countries, prior research has also shown that some people are more likely to support human rights than other people. Support for human rights is also predicted by greater world knowledge (Grace & Van Velzer, 1951) and greater empathy (McFarland & Mathews, 2005). Religiosity has mixed results with support for human rights. One study found that support was negatively predicted by religiosity (Moghaddam & Vuksanovic, 1990), while another study found that support was positively predicted by religiosity (McFarland & Mathews, 2005). In addition, support for human rights is also positively predicted by universalism (Cohrs et al., 2007), a value that reflects the ability to consider others as equals and concern for protecting the welfare of others (Schwartz, 2012). Although valuing humanity is predictive of support for human rights, being concerned about a range of foreign global issues (i.e., globalism) is not significantly related to support for human rights (McFarland & Mathews, 2005); instead, globalism is positively associated with a commitment to human rights and negatively associated with restriction of human rights (McFarland & Mathews, 2005).

Human rights attitudes are also predicted by political orientation. Research indicates that individuals upholding a conservative political orientation are less likely to support a range of human rights, and individuals upholding a liberal political orientation are more likely to support a range of human rights (Crowson, 2004; Hertel et al., 2009; Moghaddam & Vuksanovic, 1990). Three studies found that political orientation was not predictive of support for human rights (Cohrs et al., 2007; Crowson & DeBacker, 2008; McFarland & Mathews, 2005). However, of these studies, one found that having a conservative political orientation was predictive of agreement with the military enforcement of human rights (Cohrs et al., 2007). Another found that having a liberal political orientation was associated

with a greater commitment to human rights and lesser restriction of human rights (McFarland & Mathews, 2005). Thus, it appears that there is a tendency for individuals with a liberal political orientation to support human rights and for individuals with a conservative political orientation to be more willing to restrict human rights.

Beyond liberal-conservative political orientation, past research has also examined the role of political ideology, in particular Right-Wing Authoritarianism (RWA) and Social Dominance Orientation (SDO), in predicting human rights support. RWA measures the extent to which an individual abides by traditional societal norms, is willing to submit to authority figures, and shows aggression towards out-group members who do not conform (Altemeyer, 1981). SDO measures the extent to which an individual desires and supports social hierarchy, and that their in-group be dominant over and superior to other groups (Pratto et al., 1994). Prior research has found that individuals with higher levels of RWA are less likely to support human rights (Cohrs et al., 2007; Moghaddam & Vuksanovic, 1990; Stellmacher et al., 2005). McFarland and Mathews (2005) found that RWA was not associated with support for human rights but negatively predicted commitment to human rights. Similarly, a higher level of SDO is associated with a lower support for human rights (McFarland & Mathews, 2005; Pratto et al., 1994; Stellmacher et al., 2005). However, Cohrs et al. (2007) found that SDO was not significantly associated with support for human rights.

Furthermore, there is a large amount of literature examining the demographic predictors of attitudes towards human rights. Research has found that, overall, individuals with a higher education are more likely to support human rights (Barrows et al., 1981; Getz, 1985; Stellmacher et al., 2005). Regarding gender, some research has found that women are more likely to support human rights than men (Diaz-Veizades et al., 1995), are more likely to spend money and sign petitions to promote human rights than men (Stellmacher et al., 2005), and are less likely to support the restriction of human rights than men (Crowson & DeBacker,

2008). In contrast, other research indicates that the relationship between gender and support differs depending on the specific type of human right (Hertel et al., 2009), while other research indicates that gender has no relationship with support for human rights (McFarland & Mathews, 2005). Research looking at the relationships between human rights support and other demographic variables such as age, income, and ethnicity has produced mixed findings (Hertel et al., 2009; McFarland & Mathews, 2005; Stellmacher et al., 2005).

There are various methodological limitations to consider when interpreting the results of these studies. For one, many of these studies are conducted on small samples of college students in the United States (Crowson, 2004; Crowson & DeBacker, 2008; Diaz-Veizades et al., 1995; Getz, 1985; Moghaddam & Vuksanovic, 1990). Research has shown that findings from student samples may not be generalisable to the general public, particularly when examining attitudinal variables (Hanel & Vione, 2016). Moreover, research has found cross-cultural differences in terms of human rights attitudes; however no studies have examined the human rights attitudes of the New Zealand population. Both of these factors indicate that the results of many of these studies may not be generalisable to the general public or New Zealand.

Regardless of these limitations, support for human rights appears to be high across the world. Moreover, greater human rights support appears to be more likely among women, individuals with a higher education, individuals who value universalism, and individuals with a lower level of SDO and RWA. Thus, these people may be more likely to support a rights-based climate change response than others, especially if these same people are more likely to believe in and be concerned about climate change. To better understand whether individuals who are more likely to support human rights are also more likely to have higher levels of climate beliefs and concern, it is necessary to examine how predictors of human rights attitudes relate to predictors of climate change beliefs.

Social-Psychological and Demographic Predictors of Climate Change Beliefs

In contrast to human rights, the literature surrounding the predictors of environmental beliefs and behaviours is more established (for a review, see Gifford & Nilsson, 2014; Milfont & Schultz, 2018). Here, we mainly review studies looking at climate change beliefs (including beliefs about the reality of climate change and human causation, and concern for climate change), but we also review some studies looking at predictors of environmental concern and behaviours more generally.

Research has found that the public's belief in climate change, and concern for climate change, has increased over time. A systematic review examining 57 cross-cultural studies from 1980-2010 revealed an overall increase in concern for climate change from approximately 2008 onwards (Capstick et al., 2015). However, Capstick et al.'s (2015) systematic review also revealed that this increase in climate change concern was restricted to developed countries, with developing countries showing an increase in climate change scepticism from the late 2000s onwards. Similarly, research conducted in New Zealand has shown that the public's belief in climate change, and belief in the anthropogenic cause of climate change, has been increasing steadily since 2009, with the greatest increase from 2013 onwards (Milfont et al., 2017). However, there remains a consistent minority of people who deny, or are sceptical about, climate change (Capstick et al., 2015; Crawley et al., 2020; Steentjes et al., 2017).

Climate change beliefs are predicted by demographic and socio-psychological differences between people. In other words, research has shown that that, similar to support for human rights, some people are more likely to believe in climate change than others. Providing a summary of this literature, Hornsey et al. (2016) conducted a meta-analysis on the results of 25 polls and 171 studies from 56 nations looking at predictors of climate change beliefs. Although the majority of the 171 studies are from the United States of America

(USA) or other WEIRD (Western, Educated, Industrialised, Rich and Democratic) countries

(48% and 36% of the 171 studies, respectively), results also included 16% of studies from

non-WEIRD countries[2] (see Supplementary Information in Hornsey et al., 2016).

The meta-analytical results indicated that the largest demographic predictor of climate

change belief was political affiliation, followed by political ideology. More specifically,

individuals with a liberal political affiliation and ideology are more likely to believe that

climate change is real than individuals with a conservative political affiliation and ideology.

The importance of political ideology and political affiliation in determining environmental

attitudes is supported in more recent studies (Cheung et al., 2019; Cruz, 2017), in which one

study found that the strength of the relationship may differ between countries (Hornsey et al.,

2018). Other demographic variables (such as age, gender, and income) had smaller effects on

climate change beliefs than political orientation and affiliation. Despite having small effect

sizes, the meta-analysis shows that people are more likely to believe in climate change and

engage in environmentally friendly behaviours if they are younger, woman, an ethnic

minority, and if they have a higher education, compared to their counterparts.

Among the socio-psychological characteristics investigated, unsurprisingly,

ecological worldviews had the largest effect on climate beliefs. More specifically, higher

scores on the New Ecological Paradigm, a construct that measures environmental concern,

positively predicted the belief that climate change is real. Along with valuing the

environment, cultural values also predict climate change beliefs. More specifically, people

who hold individualistic cultural values are less likely to believe in climate change compared

to individuals who hold communitarian values. Overall, the meta-analysis indicates that

characteristics such as political affiliation, political ideology, and ecological worldviews are

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[2] We followed the methodology of prior research to categorise other WEIRD and non-WEIRD countries (see Arnett, 2008). Other WEIRD countries included Australia, New Zealand, Canada, along with countries in Europe, and other English speaking countries. Non-WEIRD countries included Israel, along with countries in Latin America, Asia, Middle East, and Africa.

highly important in determining individual climate change beliefs. Additionally, to a lesser degree, demographic characteristics also determine climate change beliefs.

Beyond variables included in the meta-analysis by Hornsey et al. (2016), research has also shown that SDO and RWA predict climate change beliefs. Individuals with higher levels of SDO are less likely to believe in climate change or to engage in climate mitigating behaviours (Häkkinen & Akrami, 2014; Milfont, Bain, et al., 2017; Milfont et al., 2020; Milfont et al., 2013). In terms of RWA, one study found no relationship between RWA and climate change denial (Häkkinen & Akrami, 2014), while two studies found that RWA was a weak predictor of pro-environmental beliefs after controlling for SDO (see Milfont et al., 2013, Studies 3 and 4; Stanley et al., 2019). However, most research indicates that a higher level of RWA is positively associated with climate change denial and negatively associated with other pro-environmental beliefs (Kerr & Wilson, 2021; Schultz & Stone, 1994; Stanley & Wilson, 2019; Stanley et al., 2017).

Despite these limitations, the literature suggests that, like human rights attitudes, there are a range of demographic and socio-psychological characteristics that influence climate change beliefs. It is likely, then, that some individuals will be more likely to support both of these constructs more than others. However, there is a lack of research indicating how climate change beliefs may relate to human rights support. It is important that we understand how human rights support and climate change beliefs overlap before implementing a rights-based climate change response.

Linking Human Rights Support and Climate Change Beliefs

Although scholarly work on the extent to which human rights support and climate change beliefs are linked is limited, there is increasing acknowledgement that a relationship exists between the two concepts. Indeed, the recent book chapter by Feygina and colleagues (2020) highlights the various ways that climate change impacts human rights. These authors

highlight that the interaction between climate change and human rights is entrenched in a system of inequality, in which the consequences of climate change such as pollution and extreme weather events disproportionately impacts poorer communities. In addition, climate change detrimentally impacts food availability, agricultural unemployment, and physical and psychological health. Ultimately, climate change destabilises social and political systems set out to protect human rights. Thus, climate change and human rights are not separate from one another; the consequences of climate change are a violation of human rights.

Beyond this broad conceptual intersection between human rights and climate change, we can draw on the literatures that have dealt with them separately to identify common empirical grounds. The literature reviewed in the previous sections examining socio-psychological and demographic predictors indicates an overlap in the nomological network of human rights attitudes and climate change beliefs in terms of the types of people who are likely to support both of these concepts. Women and people with a higher education, lower levels of SDO and RWA, and higher universalism scores are more likely to support human rights and believe in climate change than their counterparts. Thus, the literature surrounding human rights and climate change indicates that these concepts intersect in different ways. In other words, along with the fact that climate change poses a direct threat to human rights, these concepts are also related socio-psychologically.

Furthermore, research examining the relationship between values and environmental attitudes indicates that there may be a relationship between caring for humanity and caring for the environment more broadly. To illustrate, values, which can be defined as guiding principles in one's life, are predictive of environmental beliefs and human rights attitudes (Boer & Fischer, 2013; Cohrs et al., 2007). In particular, valuing humanity appears to be a key predictor of environmental concern and support for human rights. Results of a meta-analysis that examined 91 studies, with a total of 30,357 participants, found that self-

transcendence—a value that reflects greater tolerance of people and the world—was predictive of pro-environmental attitudes (Boer & Fischer, 2013). Furthermore, self-transcendence entails the values of universalism and benevolence. Universalism reflects the extent to which an individual considers others as equals and is concerned for protecting the welfare of others and nature. Benevolence reflects the extent to which an individual is concerned with protecting and caring for those in the 'in-group' or smaller community (Schwartz, 2012). Not surprisingly, universalism predicts endorsement of human rights (Cohrs et al., 2007) and longitudinally predicts the belief that climate change is real (Prati et al., 2018). In fact, self-transcendence and universalism predict greater environmental concern even after the environmental items within the scale have been removed (Milfont et al., 2010; Schultz et al., 2005), which indicates that valuing humanity may be a distinct predictor of environmental concern. However, benevolence has mixed findings with environmental attitudes. One study found no relationship between benevolence and climate change beliefs (Prati et al., 2018) and another found that benevolence predicted negative attitudes towards climate change (Weko, 2021). Thus, while it appears that there is a relationship between humanitarian concerns and environmental concerns, this relationship may reflect the extent to which an individual values humanity as a whole, including those who are not in their in-group.

Along with the literature above indicating that humanitarian concerns are associated with environmental concerns and human rights attitudes, identifying with humanity is also predictive of environmental beliefs. In a literature review examining studies that measured the extent to which individuals identify with humanity, pro-environmental beliefs and behaviours were consistently predicted by identifying with humanity, feeling connected to humanity, and feeling a sense of belonging with people all over the world (McFarland et al., 2019). These studies provide further evidence of an overarching relationship between

humanitarian concerns and environmental concerns. Overall, it appears that for those whose concern lies beyond themselves to include the rest of humanity, that this concern also extends to the natural environment.

We can expect that if humanitarian concerns and environmental concerns are related, human rights attitudes and climate change beliefs will also be related. However, to our knowledge, only two studies have measured the relationship between human rights and the environment more directly. Barrows et al. (1981) developed a test assessing college students' global knowledge of world issues and validated it in approximately 3,000 students in the USA. In one section of the test, students ranked global issues according to perceptions of the issue, such as importance and solvability. A factor analysis was conducted, and results were depicted visually in plots, with solvability measured on the vertical axis and factors such as importance, interest, and knowledge of the issue measured on the horizontal axis. Results showed that the issues "Malnutrition and Inadequate Healthcare", "Environmental Pollution", "Depletion of Natural Resources" and "Denial of Basic Human Rights" were relatively clustered together, with students across distinct age groups ranking them relatively high on factors such as importance and solvability (see Figure 3.10.12a, Figure 3.10.12b, and Figure 3.10.12c in Barrows et al.,1981). However, of note was that the issues of "Denial of Basic Human Rights" and "Malnutrition and Inadequate Healthcare" were consistently ranked slightly higher in terms of solvability, but slightly lower on factors such as importance, when compared to "Depletion of Natural Resources" and "Environmental Pollution". These findings indicate that there are small differences in how these issues are perceived, in which human rights may be considered less important than environmental issues but easier to resolve. However, these issues appear to be perceived at a relatively similar level of importance to one another.

More recently, in a survey conducted by the Chicago Council of Global Affairs, participants were asked to rate the importance of foreign policy goals for distinct issues ranging from 'very important' to 'not important at all'. Using this data, Holsti (1996) found that the importance attributed to "protecting the global environment" as a foreign policy goal correlated positively with the importance attributed to "promoting and defending human rights in other countries" as a foreign policy goal. Gamma correlation coefficients ranged from .55 (1988) to .63 (1984) across four time points (no sample sizes were reported). The results of these two studies provide further evidence that human rights issues and environmental issues are perceived to be similarly as important as one another. Thus, we can expect that support for human rights will also be positively associated with belief in climate change and concern for climate change.

However, it is important to note that the results of these two studies are limited in their generalisability. For one, both studies were conducted in the United States, with the study by Barrows et al. conducted on a sample of college students. Thus, we do not know whether we would find the same relationships in a more diverse population. Moreover, both studies were conducted using data from over 30 years ago, so we do not know whether these results reflect the attitudes of the public today. The degree to which public attitudes have changed over time is important to acknowledge, particularly because research has shown that belief in climate change and concern for climate change has been changing over time (Capstick et al., 2015; Milfont et al., 2017). Despite these limitations, and although these studies only briefly touch on the relationship between humanitarian concerns and environmental concerns, the results provide more direct evidence of a relationship between attitudes towards human rights and attitudes towards the environment. However, we do not know whether a relationship would also be found between human rights support and climate change beliefs more specifically.

The Present Study

To our knowledge, no studies have directly tested the relationship between human rights support and climate change beliefs. The current study aims to address this gap in the literature by formally examining this relationship using a national probability sample from the New Zealand Attitudes and Values Study (NZAVS). We examine the relationship between support for the two different types of human rights included in the NZAVS (i.e., *the right to just and reasonable pay* and *the right to food, clothing, housing, and medicine*) and two different climate change beliefs (i.e., the belief that climate change is real, the belief that climate change is caused by humans) as well as climate change concern. In examining these relationships, we aim to answer the following research questions:

1. Is there a longitudinal association between support for human rights and climate change beliefs?

2. Are there subgroups within the New Zealand population who produce unique response patterns to the human rights and climate change items?

3. If unique response patterns are found, are the response patterns stable over a one-year period?

To answer these research questions more systematically, we use a mixture of variable-centred and person-centred analyses (Howard & Hoffman, 2017; Osborne & Sibley, 2017). Variable-centred analyses offer information about the relationships between variables, for example, one variable's effect on another. Variable-centred analyses carry the assumption that the relationship acts similarly across the population; thus, a single set of parameters is estimated for the population. In contrast, person-centred analyses offer information about how individual differences may change the relationship between specific variables. Person-centred analyses identify similarities between individuals and use these similarities to produce subgroups, with the aim of finding the optimal number of sub-groups to accurately

represent the population. Thus, a person-centred analysis may produce multiple sets of parameters for different subgroups within the population.

We first use a variable-centred, autoregressive cross-lagged model to examine the longitudinal relations between human rights support and climate change beliefs (and vice-versa) over a one-year period, which was the time gap for the available data. We then use a person-centred, Latent Profile Analysis (LPA) to identify specific subgroups of unique response patterns in the New Zealand population. To better understand these subgroups, we use a three-step multinomial regression to examine whether certain demographic and socio-psychological characteristics predict membership in these subgroups. Finally, we complement this with another person-centred, Latent Transition Analysis (LTA) to examine the stability of these subgroups over a one-year period.

Considering our goal of better understanding the relationship between human rights attitudes and climate change beliefs, we investigated three hypotheses, all of which were pre-registered via the Open Science Framework (osf.io/afqc6/). The hypotheses were as follows:

H1: For the cross-lagged analysis, we expect to find a bidirectional, longitudinal relationship between support for human rights and climate change beliefs.

H2: For the LPA, we expect to find at least two subgroups with unique response patterns to the items. Specifically, we expect to find one subgroup that places more emphasis on support for human rights and climate change beliefs (*high scorers* on both), and another that places less emphasis on support for human rights and climate change beliefs (*low scorers* on both).

H3: For the LTA, we expect the identified subgroups to remain stable over a one-year period. Although we did not elaborate on why we hypothesise to see

stability in our pre-registration, we expect these groups to remain stable because we look at a short interval of one year. Other studies using LTA over one year have found that subgroups remain relatively stable (Pan et al., 2017; Stronge et al., 2019). Additionally, as shown in a variable-centred study, the pattern of change for climate change beliefs has been relatively small over time (Milfont et al., 2017).

Method

Sampling procedure

This research uses data from Time 5 (2013) and Time 6 (2014) of the NZAVS, a nation-wide study that has collected information about the socio-political attitudes of the New Zealand population annually since 2009. Participants of the NZAVS were randomly sampled using a stratified random procedure, taken from New Zealand citizens on the Electoral Roll. Participants were posted a copy of the questionnaire, with a second postal follow-up two months later. Participants who provided an email address in a previous wave were also emailed and invited to complete an online version if they preferred. Participants were offered an entry into a prize draw for participation.

There were 18,261 participants in Time 5 (2013), of which 10,502 participants were from previous waves of the study, with an additional two booster samples taken from the Electoral Roll (without replacement) to increase the sample size and sample diversity ($n = 7,579$). Additionally, there were 179 unmatched participants or unsolicited opt-ins included in the Time 5 sample. There were 15,820 participants in Time 6 (2014), of which 15,740 were retained from a previous wave, and 14,878 were retained from Time 5. Of the sample size in Time 6, 82 participants were unmatched or unsolicited opt-ins. See the NZAVS website for more information on sampling strategies: http://www.nzvalues.com.

The NZAVS is reviewed every three years by the University of Auckland Human Participants Ethics Committee. The first phases of the longitudinal study were approved on

09-September-2009 for 3 years (reference number: 2009/336). Ethics approval for the study was re-approved by the University of Auckland Human Participants Ethics Committee on 17-February-2012 until 09-September-2015 (reference number: 6171), and then on 03-June-2015 until 03-June-2018 (reference number: 014889). All participants granted informed written consent. Contact details are removed when the questionnaires are received, and all data were de-identified before analyses were conducted. NZAVS data is hosted at the University of Auckland, and the de-identified data is available to appropriately qualified researchers upon request for the purposes of re-analysis.

Participants

The sample of the cross-sectional analysis was restricted to participants who provided partial or complete responses to the two human rights items and the three climate change items at Time 5 (N = 17,656), and the sample of the longitudinal analyses were restricted to participants who provided partial or complete responses to the two human rights items and the three climate change items at Time 5 and Time 6 (n = 14,857). Of the cross-sectional sample, 62.6% were female (n = 11,051) and 37.4% were male (n = 6,602). Participants were aged between 18 years old and 94 years old, with an average age of 48 (SD = 14.08). In terms of ethnicity, 15,132 respondents identified as New Zealand European, and 2,225 respondents identified as Māori. There were 1,784 respondents that were neither New Zealand European nor Māori. Note that respondents could state more than one ethnicity, and so ethnicity could be counted more than once. In terms of education, 6.7% reported having no qualification or did not report their education (n = 1175), 31.8% reported at least some high school, 19.7% reported having a certificate or diploma, 23.9% reported completing studies at undergraduate level, and 17.9% reported completing postgraduate studies. The average total household income of the sample was $101,934.

Measures

Human rights support and climate change beliefs were measured at Time 1 and Time 2. All demographic and socio-psychological covariates were measured at Time 1 only. The descriptive statistics of the human rights items, climate change items, and socio-psychological covariates can be found in Appendix A.

Human Rights and Climate Change

Human rights support was assessed using the following items: "Everyone has the right to just and reasonable pay for the work they perform", and "Everyone has the right to food, clothing, housing and medicine, no matter what". Participants rated these items on a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). Climate change beliefs were assessed using the following items: "Climate change is real", "Climate change is caused by humans", and "I am deeply concerned about climate change". Participants rated these items on a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree).

All items were presented in the same set of items for both time periods, and the order in which the items were presented was consistent across both time periods. The item "Everyone has the right to just and reasonable pay for the work they perform" was presented before the other items; The items "Climate change is real", Climate change is caused by humans", and "I am deeply concerned about climate change" were presented together in that sequence; and the item "Everyone has the right to food, clothing, housing and medicine, no matter what" was presented after the other items. However, the number of other items separating the human rights items from the climate change items differed each year.

Predictors of Profile Membership for the Latent Profile Analysis

Demographics

The demographic variables included in the analysis were age, gender (dummy coded as 0 = female, 1 = male), New Zealand European (0 = other ethnicity, 1 = New Zealand

European), Māori (0 = other ethnicity, 1 = Māori), estimated total household income,

education level (0 = No Qualifications to 10 = Doctoral Degree), political orientation (1 =

very liberal to 7 = very conservative).

Social Dominance Orientation (SDO)

Social Dominance Orientation was assessed using six items from Sidanus and Pratto's

SDO scale (Sidanius & Pratto, 1999). Participants rated how strongly they agreed or

disagreed with each statement on a 7-point Likert scale ranging from 1 (strongly disagree) to

7 (strongly agree). The items assessing SDO were: "It is OK if some groups have more of a

chance in life than others", "To get ahead in life, it is sometimes okay to step on other

groups", "It would be good if groups could be equal" (reverse-scored), "Inferior groups

should stay in their place", "We should have increased social equality" (reverse-scored), and

"We should do what we can to equalize conditions for different groups" (reverse-scored).

Items were averaged after reverse coding relevant items to form a measure of SDO (α =

0.69).

Right-Wing Authoritarianism (RWA)

Right-wing-authoritarianism was assessed using six items from the RWA scale

(Altemeyer, 1996). The items were: "It is always better to trust the judgment of the proper

authorities in government and religion than to listen to the noisy rabble-rousers in our society

who are trying to create doubt in people's minds", "Our country will be destroyed some day

if we do not smash the perversions eating away at our moral fibre and traditional beliefs", "It

would be best for everyone if the proper authorities censored magazines so that people could

not get their hands on trashy and disgusting material", "People should pay less attention to

The Bible and other old traditional forms of religious guidance, and instead develop their

own personal standards of what is moral and immoral" (reverse-scored), "Some of the best

people in our country are those who are challenging our government, criticizing religion, and

ignoring the "normal way" things are supposed to be done" (reverse-scored), and "Atheists and others who have rebelled against established religions are no doubt every bit as good and virtuous as those who attend church regularly" (reverse-scored). Items were averaged after reverse coding relevant items to form a measure of RWA ($\alpha = 0.69$).

Data Analysis

The main analyses were conducted using Mplus version 8.6 (Muthén & Muthén, 1998-2017). All analyses were pre-registered. To begin, we calculated the correlations of the variables included in the analysis. These correlations can be found in Appendix B.

To test our first hypothesis, we conducted an autoregressive cross-lagged model. A cross-lagged model is a variable-centred analysis that calculates the longitudinal associations between variables, while controlling for the stability of each construct over time, the associations between variables at the first measurement point, and the residual associations between measurements at the second measurement point. To these ends, we used two waves of data to estimate a cross-lagged model that examined the stability of each construct over time (i.e., the correlation between each human rights and climate change item at Time 1 and Time 2), and the cross-lagged paths between the different constructs (i.e., whether Human Rights predicts Climate Change over time, and vice versa). In the second cross-lagged model we also incorporated the Time 1 measures of all covariates. This allowed us to test whether the relationship between human rights and climate change remained statistically significant after controlling for demographic and socio-psychological variables. We evaluated model fit using the Comparative Fit Index (CFI), the Root Mean Square Error of Approximation (RMSEA), and the Standardized Root Mean Squared Residual (SRMR). CFI values above .95, RMSEA values below .06, and SRMR values below .08 were used as a measure of good model fit (Hu & Bentler, 1999).

For the second analysis, we conducted an LPA. An LPA is a person centred analysis that identifies underlying subgroups of the population who produce unique response patterns to the human rights and climate change items. To conduct the LPA, we estimated different profiles at Time 5. These profiles were identified by firstly testing a 1-profile baseline model, used as a comparison model. We then tested models with more profiles to identify the model that fit the data the best. We used several indicators to identify which model best fits the data, including: Akaike Information Criterion (AIC), Bayesian Information Criterion (BIC), Entropy, and log-likelihood. These indicators were used to select the model that best fits the data, and the model that provides the most parsimonious solution. To better understand the heterogeneity between the identified profiles, we analysed the demographic and socio-psychological predictors of group membership by conducting a three-step multinomial regression.

For the final analysis, we conducted an LTA. An LTA is a person-centred analysis that calculates the probabilities of transitioning from each profile to every other profile (for example, transitioning from a profile of higher emphasis on both human rights and climate change, to a profile of low emphasis on both), along with calculating the probability of remaining in the same profile longitudinally. We calculated the LTA using a similar process to the LPA, by estimating different profiles across both time points and by using the same model fit indicators used in the LPA to assess model fit.

Results

Cross-Lagged Analysis

To begin, we conducted a cross-lagged analysis on the human rights and climate change items across Time 5 and Time 6. Our analysis used a one-year time period because only two waves of the NZAVS included the human rights items. Our first model had a perfect fit to the data, $\chi^2(0) = .00$, $p < .00$; CFI = 1.00; RMSEA = .00, 90% CI [0.00,0.00], SRMR =

.00. The model fit statistics for our second model, which included covariates, are discussed in detail in the Supplementary Materials. Our second model had a poor fit to the data. It is important to note that although the statistics showed poor fit, global model measures are inadequate at identifying person-level misfit in structural equation models (Little, 2013). Thus, adding covariates to the model is expected to decrease the model fit statistics but does not yield the model theoretically uninterpretable.

Table 1 presents the full results from the first cross-lagged model. Due to the complexity of the full cross-lagged model, the results are presented in separate cross-lagged paths presented in Figure 1 and Figure 2. In terms of the individual pathways of the human rights items, support for 'just and reasonable pay' was relatively less stable over the one-year period ($\beta = 0.34$, $p < .001$) compared to support for 'the right to food, clothing, housing, and medicine' ($\beta = 0.48$, $p < .001$). In terms of the individual pathways of the climate change items, all three climate change items showed reasonable stability over the one-year period (β's > 0.51, $p < .001$).

We first report the longitudinal associations from human rights to climate change as depicted in Figure 1. Inspection of the cross-lagged pathways showed that higher agreement with the human rights item 'just and reasonable pay' at Time 1 had a positive cross-lagged effect on the belief that climate change is real at Time 2 ($\beta = 0.03$, $p < .001$). However, higher support for 'just and reasonable pay' at Time 1 was not significantly associated with the belief that climate change is caused by humans ($\beta = 0.00$, $p = .93$), nor with climate change concern ($\beta = 0.01$, $p = .15$). Moreover, higher agreement with 'the right to food, clothing, housing, and medicine' at Time 1 had a positive cross-lagged effect on the belief that climate change is real ($\beta = 0.03$, $p < .001$), the belief that climate change is caused by humans ($\beta = 0.03$, $p < .001$), and concern for climate change ($\beta = 0.02$, $p < .001$).

In terms of the longitudinal associations from climate change to human rights (Figure 2), higher agreement with the item 'climate change is real' at Time 1 had a positive cross-lagged effect on support for 'just and reasonable pay' at Time 2 ($\beta = 0.07$, $p < .001$), and a positive cross-lagged effect on 'the right to food, clothing, housing, and medicine' ($\beta = 0.04$, $p < .001$). Higher agreement with the item 'climate change is caused by humans' at Time 1 had a positive cross-lagged effect on support for 'the right to food, clothing, housing, and medicine' at Time 2 ($\beta = 0.04$, $p = .001$), but was not significantly associated with support for 'just and reasonable pay' at Time 2 ($\beta = -0.02$, $p = .18$). For the final climate change item, higher agreement with 'I am deeply concerned about climate change' at Time 1 had a positive cross-lagged effect on support for 'the right to food, clothing, housing, and medicine' at Time 2 ($\beta = 0.05$, $p < .001$), but was not significantly associated with support for 'just and reasonable pay' at Time 2 ($\beta = 0.01$, $p = .21$).

Taken together, individuals who indicate greater support for human rights regarding 'the right to food, clothing, housing, and medicine' at Time 1 are more likely to believe in the reality of climate change, believe that climate change is caused by humans, and be concerned about climate change at Time 2. In turn, agreement with each climate change item at Time 1 was associated with increased support for 'the right to food, clothing, housing, and medicine' at Time 2. These results partially support our first hypothesis predicting that human rights and climate change have a bidirectional, longitudinal relationship. However, the relationship between human rights and climate change differed depending on the specific type of human rights and climate change belief. A full bidirectional association was observed for the 'right to food, clothing, housing and medicine' with each of the climate items, while the item 'just and reasonable pay' had a bidirectional association only with the item 'climate change is real'.

The paths reported above remained the same when the demographic and socio-psychological covariates were included in the model. This indicates that the relationship between human rights and climate change remains statistically significant irrespective of the age, sex, ethnicity, political orientation, education, social dominance orientation, and level of right-wing authoritarianism of the respondents. Full results from covariate testing are available in Appendix C.

Table 1

Cross-Lag Effects of Human Rights and Climate Change Items at Time 1 With Human Rights and Climate Change Items at Time 2.

	Just and reasonable pay T2		Right to food, clothing, housing, and medicine T2		Climate change is real T2		Climate change is caused by humans T2		Climate change concern T2	
	B(SE)	*β*	*B(SE)*	*β*	*B(SE)*	*β*	*B(SE)*	*β*	*B(SE)*	*β*
Just and reasonable pay T1	0.32(0.01)	0.34***	0.12(0.01)	0.10***	0.04(0.01)	0.03***	-0.00(0.01)	0.00	0.02(0.01)	0.01
Right to food, clothing, and housing T1	0.10(0.01)	0.13***	0.47(0.01)	0.48***	0.03(0.01)	0.03***	0.04(0.01)	0.03***	0.03(0.01)	0.02***
Climate change is real T1	0.04(0.01)	0.07***	0.03(0.01)	0.04***	0.47(0.01)	0.51***	0.09(0.01)	0.09***	0.13(0.01)	0.12***
Climate change is caused by humans T1	-0.01(0.01)	-0.02	0.03(0.01)	0.04***	0.12(0.01)	0.14***	0.57(0.01)	0.60***	0.16(0.01)	0.16***
Climate change concern T1	0.01(0.01)	0.01	0.04(0.01)	0.05***	0.12(0.01)	0.14***	0.12(0.01)	0.13***	0.52(0.01)	0.54***

Note. N = 14,857. T1 = Time 1. T2 = Time 2. B = unstandardized regression coefficient. SE = standard error. $β$ = standardized regression coefficient.

$\chi^2(0)$ = 0.00, p < .00; CFI = 1.00; RMSEA = .00, 95% CI [0.00,0.00]; SRMR =.00.

*p < .05; **p < .01; ***p < .001.

Figure 1

Cross-Lagged Panel Analysis of Human Rights Items Predicting Climate Change Items Over

a One-Year Interval.
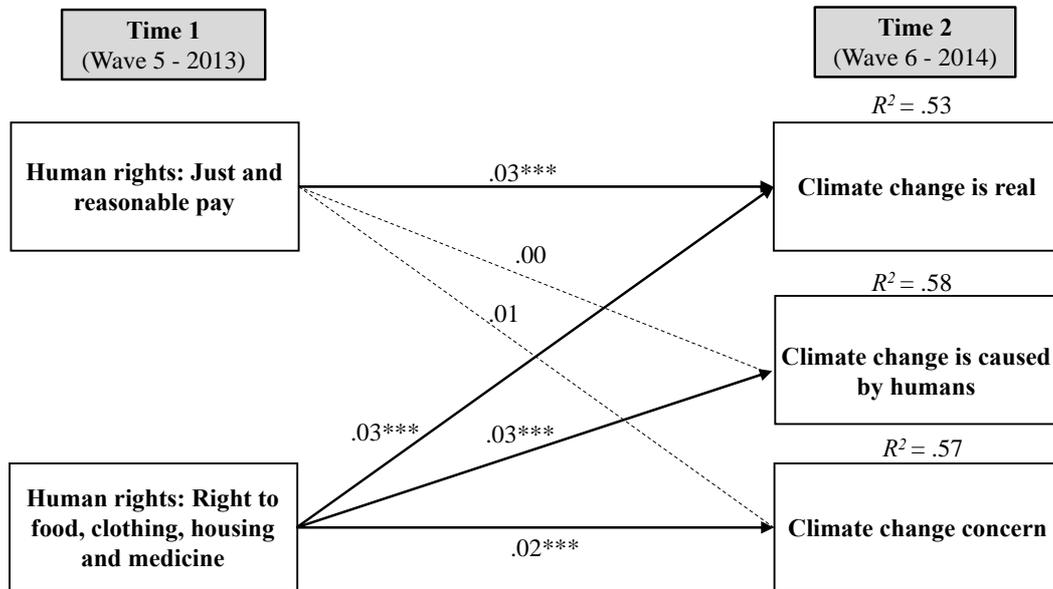
Note. N = 14,857. $\chi^2(0)$ = 0.00, p < .00; CFI = 1.00; RMSEA = .00, 95% CI [0.00,0.00]; SRMR =.00. All path

estimates are standardized.

*p < .05; **p < .01; ***p < .001.

Figure 2

Cross-Lagged Panel Analysis of Climate Change Items Predicting Human Rights Items Over a One-Year Interval.
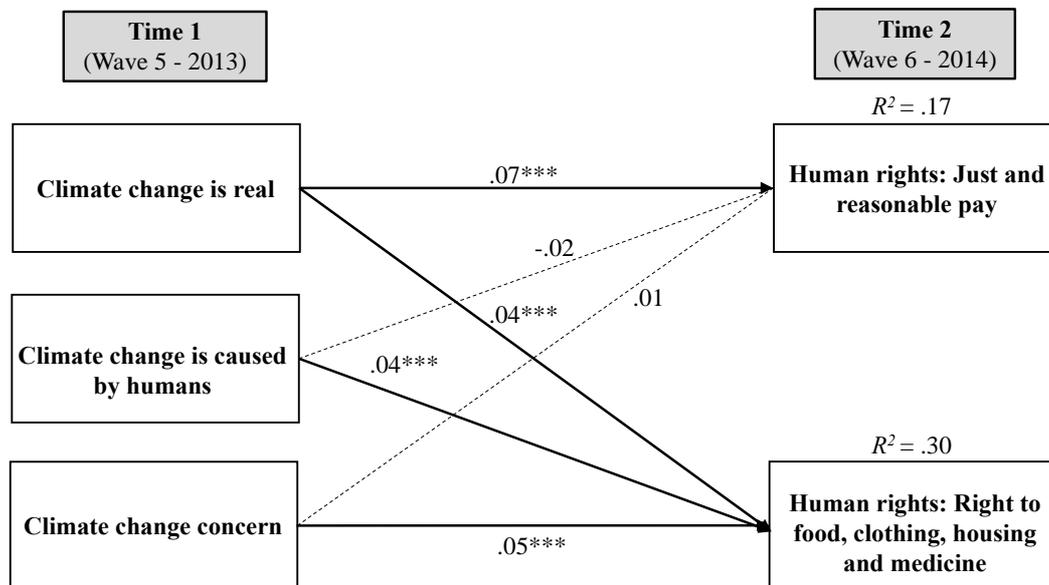
Note. $N = 14,857$. $\chi^2(0) = 0.00$, $p < .00$; CFI = 1.00; RMSEA = .00, 95% CI [0.00,0.00]; SRMR = .00. All path estimates are standardized

*p < .05; **p < .01; ***p < .001.

Latent Profile Analysis

To begin the analysis, we estimated models ranging from 2-8 profiles from the respondents who answered the human rights and climate change items at the first time point (Time 5; 2013). We used model fit statistics to identify the most parsimonious and best-fitting model. Results for the 7-profile and 8-profile models yielded model nonidentification and thus were not included in further analysis. As seen in Table 2, the sample-size adjusted BIC began to plateau after the fourth profile, but was much smaller for the 6-profile model, which also had a higher entropy (.99) than the other alternative models. This entropy value indicates that roughly 99% of the sample was correctly classified into these six profiles.

Additionally, results in Table 3 indicate that there were high levels of certainty in correct classification for all of the profiles in the 6-profile model. These results show that, for example, individuals assigned to Profile 1 had a 100% chance of being correctly classified in Profile 1 and a 0% chance of being incorrectly classified in Profile 2. The lowest level of certainty in correct classification was individuals assigned to profile 5, who had a 93% chance of being correctly classified in this profile, and a 1% chance of being incorrectly classified in profile 6. Overall, the constrained 6-profile model provided the better fitting and conceptually clear solution.

Table 4 presents the mean agreement levels with the human rights and climate change items for the final identified profiles and the percentages for each profile at Time 1. The mean agreement levels are also presented visually in Figure 3. Interestingly, all six profiles showed high support for both human rights items. More specifically, all six profiles showed slightly higher support for the item regarding just and reasonable pay than the item regarding the right to food, clothing, housing and medicine. Despite each profile having high support for human rights, these profiles varied in their climate change beliefs and concern levels.

The largest profile showed high support for both human rights items and had high scores in all three climate change items (35.8%). We thus labelled respondents in this profile *Rights-based believer and concerned*. Another profile emerged in which respondents were highly supportive of both human rights items but had low scores on all three climate change items (6.3%). Thus, we labelled this profile *Rights-based denier and unconcerned*. Respondents in the second-largest profile (24.5%) were highly supportive of human rights and had a strong belief that climate change is real but had slightly lower scores for the other climate change items than the largest profile. Thus, we labelled respondents in this third profile *Rights-based neutral believer and concerned*. Respondents in the fourth profile (16.1%) supported human rights and sat at the approximate mid-point of the scale for all

three climate items. Hence, we labelled participants in this profile *Rights-based undecided and unconcerned*. Respondents in another profile showed support for both human rights items and moderately high scores for two climate items, but the climate change concern score was only slightly above the mid-point of the scale (14.4%). We labelled respondents in this profile *Rights-based neutral believer and unconcerned*. Finally, the smallest profile that emerged (2.9%) had a high score for the belief that climate change is real but had a low score for the belief that climate change is caused by humans and climate change concern. We labelled respondents in this profile *Rights-based anthropogenic denier and unconcerned*.

Although we found one profile that placed more emphasis on both human rights and climate change, no profile emerged that placed less emphasis on both human rights and climate change. Thus, these results only partially support our initial hypothesis that there would be one profile that places more emphasis on both human rights and climate change and one profile that places less emphasis on both human rights and climate change.

Table 2

Model fit Statistics for the Models Ranging From 2-6 Profiles of the LPA

	Log Likelihood	AIC	BIC	aBIC	Ent
2 profiles	-146403.92	292839.84	292964.30	292913.45	0.82
3 profiles	-142253.19	284550.38	284721.52	284651.60	0.86
4 profiles	-140211.60	280479.20	280697.01	280608.03	0.90
5 profiles	-138518.50	277105.00	277369.48	277261.43	0.90
6 profiles	-134529.72	269139.43	269450.59	269323.47	0.99

Note. AIC = Akaike Information Criterion. BIC = Bayesian Information Criterion. aBIC = sample-size adjusted Bayesian Information Criterion

Table 3

Average Latent Class Probabilities for Most Likely Latent Class Membership (row) by Latent Class (Column) for Final Model

	N	1	2	3	4	5	6
Profile 1	1120	**1.00**	0.00	0.00	0.00	0.00	0.00
Profile 2	2549	0.00	**1.00**	0.00	0.00	0.00	0.00
Profile 3	2837	0.00	0.00	**1.00**	0.00	0.00	0.00
Profile 4	4318	0.00	0.00	0.00	**1.00**	0.00	0.00
Profile 5	520	0.00	0.00	0.00	0.00	**0.93**	0.07
Profile 6	6312	0.00	0.00	0.00	0.00	0.01	**0.99**

Table 4

Mean Levels of Human Rights and Climate Change Item Agreement, Counts (N) and

Proportions (%) of Each Profile, for the 6-Profile LPA Model

	Just & Reasonable Pay	Right to Food, Clothing, Housing & Medicine	Climate Change is Real	Climate Change is Caused by Humans	Climate Change Concern	N	(%)
Rights-based denier and unconcerned	6.13	5.61	1.52	2.19	2.01	1120	6.3%
Rights-based undecided and unconcerned	6.10	5.85	3.74	3.84	3.37	2837	16.1%
Rights-based anthropogenic denier and unconcerned	6.50	5.86	7.00	2.59	3.06	520	2.9%
Rights-based believer and concerned	6.54	6.46	7.00	6.44	5.92	6312	35.8%
Rights-based neutral believer and unconcerned	6.05	5.88	5.00	4.64	4.00	2549	14.4%
Rights-based neutral believer and concerned	6.19	6.06	6.00	5.23	4.69	4318	24.5%

Note. N = 17,656.

Figure 3

Mean levels of agreement with each human rights and climate change item for each profile for the 6-profile LPA Model
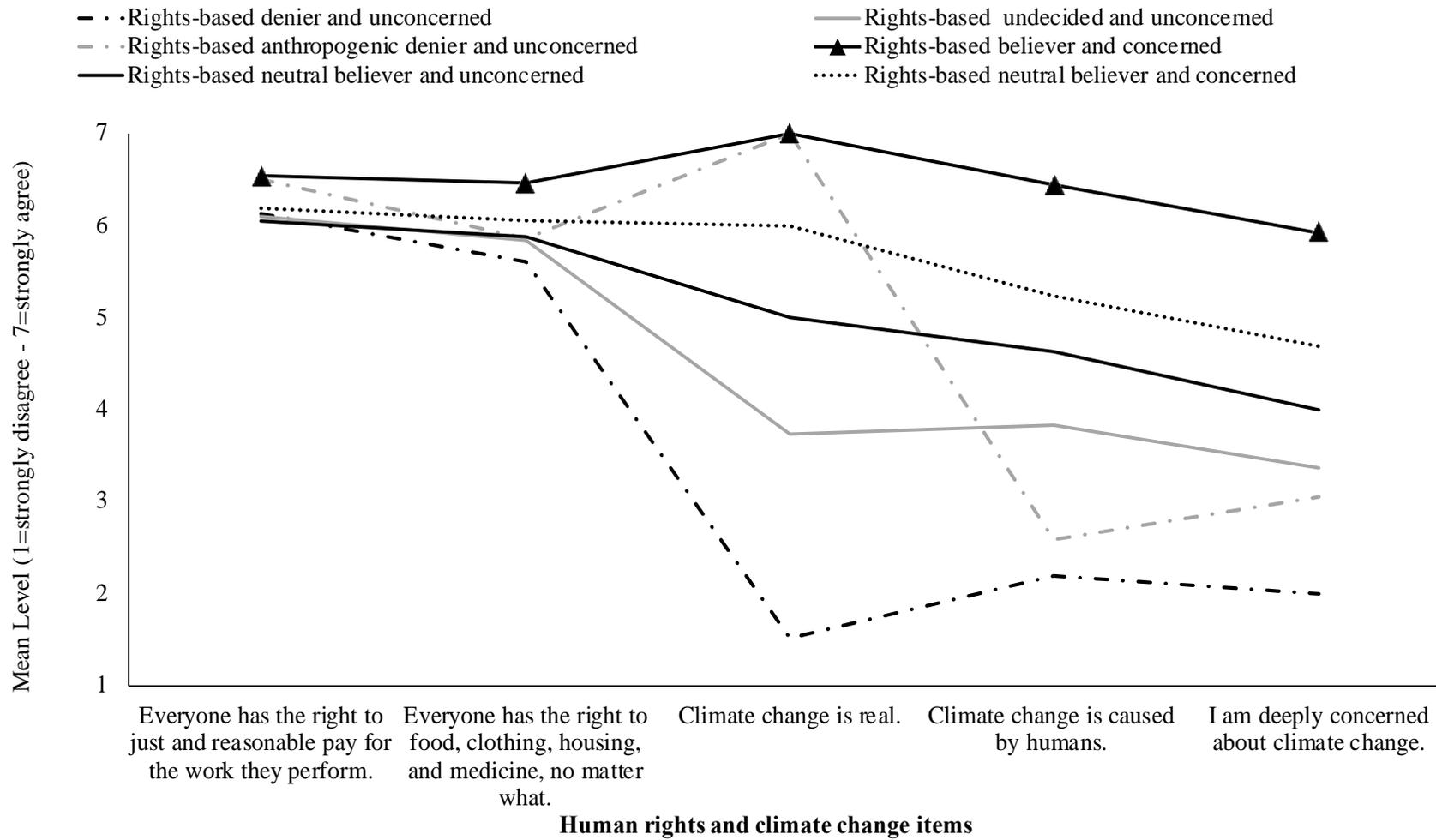
Predictors of Profile Membership

To better understand the identified profiles, we conducted a three-step multinomial logistic regression to examine which demographic and socio-psychological variables were predictive of profile membership. The profile highest for both climate change and human rights (i.e., *Rights-based believer and concerned*) served as the reference profile for the analysis. Table 5 presents the results.

Regarding the demographic variables, an opposing pattern emerged in terms of the two largest ethnic groups in New Zealand. While New Zealand Europeans were more likely to be a member of every other profile when compared to the *Rights-based believer and concerned* reference profile ($Bs \geq 0.50$, $ps < .05$), Māori respondents were less likely to be a member of every other profile when compared to the *Rights-based believer and concerned* reference profile ($Bs \geq -0.26$, $ps < .05$). Odds Ratios suggest that, for example, New Zealand Europeans were 2.91 times more likely to be a member of the profile of the lowest climate belief and concern scores (*Rights-based denier and unconcerned).* In contrast, Māori were 40% less likely to be a member of this profile, compared to the *Rights-based believer and concerned* profile.

When considering gender, results for men and New Zealand Europeans had similar patterns. Like New Zealand Europeans, men were more likely to be a member the *Rights-based denier and unconcerned* profile ($B = 0.41$, $p < .001$), and the *Rights-based anthropogenic denier and unconcerned* profile ($B = 0.58$, $p < .001$), compared to the *Rights-based believer and concerned* profile. However, unlike New Zealand Europeans, men were not significantly likely to be a member of any of the other profiles ($ps > .05$).

Age, education, and income showed varying results across profiles. Older people were more likely to be a member of the *Rights-based denier and unconcerned* profile ($B = 0.01$, $p < .001$), and the *Rights-based undecided and unconcerned* profile, compared to the

Rights-based believer and concerned profile ($B = 0.01$, $p < .05$). However, younger respondents were slightly more likely to be a member of a profile with relatively neutral climate change belief scores (vs *Rights-based believer and concerned),* that is, the *neutral believer and unconcerned* profile ($B = -0.01$, $p < .001$). Similarly, education was predictive of membership across three profiles compared to the *Rights-based believer and concerned* profile. Specifically, lower education was predictive of membership in the *Rights-based deniers and unconcerned* profile ($B = -0.02$, $p < .05$), *Rights-based neutral believer and unconcerned* profile ($B = -0.01$, $p < .01$), and the *Rights-based neutral believer and concerned* profile ($B = -0.01$, $p < .001$). Income was only predictive of one profile, in which lower-income predicted membership in the *Rights-based anthropogenic denier and unconcerned* profile (vs *Rights-based believer and concerned*) profile ($B = -0.02$, $p < .05$).

Regarding the ideological variables, a similar pattern was found for SDO, RWA, and conservative political orientation. Higher levels of SDO, and conservative political orientation, both increased the likelihood of belonging to any of the other five profiles when compared to the *Rights-based believer and concerned* profile ($Bs \geq 0.53$, $ps < .001$, and $Bs \geq 0.23$, $ps < .001$, respectively). Similarly, higher levels of RWA increased the likelihood of belonging to profiles that placed lower levels of importance to both human rights and climate change compared to the *Rights-based believer and concerned* profile. The exception to this pattern was the *Rights-based anthropogenic denier and unconcerned* (vs *Rights-based believer and concerned*) profile, in which RWA was not predictive of membership in this profile ($p > .05$).

Overall, the profile comparisons provide a clear picture of the demographic characteristics that make up the profile of the strongest climate beliefs and concern. People with a liberal political orientation, a lower SDO score, a lower RWA score, and people of Māori ethnicity were generally more likely to belong in the *Rights-based believer and*

concerned profile relative to the other profiles. In contrast, New Zealand Europeans were more likely to be a member of every other profile relative to the *Rights-based believer and concerned* profile. The remaining predictors inconsistently predicted membership in the *Rights-based believer and concerned* profile relative to the other five profiles.

Table 5

Multinomial Logistic Regression Predicting the Likelihood of Belonging to Each Profile (Relative to the Rights-based Believer and Concerned Profile) as a Function of Demographic and Socio-Psychological Predictors.

	Rights-based denier and unconcerned (vs. Rights-based believer and concerned)			Rights-based undecided and unconcerned (vs. Rights-based believer and concerned)			Rights-based anthropogenic denier and unconcerned (vs Rights-based believer and concerned)			Rights-based neutral believer and unconcerned (vs. Rights-based believer and concerned)			Rights-based neutral believer and concerned (vs. Rights-based believer and concerned)		
	B	*SE*	Odds Ratio	*B*	*SE*	Odds Ratio	*B*	*SE*	Odds Ratio	*B*	*SE*	Odds Ratio	*B*	*SE*	Odds Ratio
Gender[a]	0.41***	0.08	1.51	-0.01	0.06	0.99	0.58***	0.12	1.78	-0.06	0.06	0.94	-0.02	0.05	0.98
Age	0.01***	0.00	1.01	0.01*	0.00	1.01	0.01	0.00	1.01	-0.01***	0.00	0.99	-0.00	0.00	1.00
NZ European[b]	1.07***	0.15	2.91	0.83***	0.10	2.30	0.50*	0.18	1.64	0.59***	0.09	1.80	0.53***	0.08	1.70
Māori[c]	-0.51***	0.13	0.60	-0.37***	0.08	0.69	-0.50*	0.20	0.61	-0.50***	0.09	0.64	-0.26***	0.07	0.77
Education Level	-0.02*	0.01	0.98	-0.01	0.00	0.99	-0.01	0.01	0.99	-0.01**	0.00	0.99	-0.01***	0.00	1.00
Income	0.00	0.01	1.00	-0.01	0.00	1.00	-0.02*	0.01	0.98	0.00	0.00	1.00	0.00	0.00	1.00
Conservative Political Orientation	0.50***	0.04	1.65	0.39***	0.03	1.47	0.42***	0.06	1.52	0.31***	0.02	1.37	0.23***	0.02	1.26
SDO	0.94***	0.05	2.55	0.76***	0.03	2.13	0.71***	0.08	2.03	0.77***	0.03	2.16	0.53***	0.03	1.70
RWA	0.35***	0.04	1.42	0.30***	0.03	1.35	-0.00	0.07	1.00	0.28***	0.03	1.33	0.23***	0.02	1.26

Note. $N = 17,656$. LL = -134529.72; AIC = 269139.43; BIC = 269450.59; aBIC = 269323.50. Ent = 0.99; [a]Gender was dummy-coded (0 = female; 1 = male). [b]NZ European was dummy-coded (0 = all other ethnicities; 1 = NZ European). [c]Māori was dummy-coded (0 = all other ethnicities; 1 = Māori). SDO = social dominance orientation. RWA = right-wing authoritarianism. *B* = unstandardized regression coefficient. *SE* = standard error.

*$p < .05$; **$p < .01$; ***$p < .001$.

Latent Transition Analysis

We then conducted an LTA to understand whether the profiles identified in the LPA changed over a one-year period. As mentioned previously, our analysis used a one-year time period because only two waves of the NZAVS included the human rights items. Our model assumes that the rates of transition represent a stationary process in that similar rates of transition would be found over any particular observation period.

Similar to the LPA, we began the LTA by estimating models ranging from 2-8 profiles from the respondents who completed both the human rights and climate change items, except this time using responses from both time points. To estimate the same latent profiles at both time points, we constrained the intercepts of the human rights and climate change items within each profile at the first time point to be equal to the corresponding profile at the second time point. We used model fit statistics to identify the best-fitting and most parsimonious model, which can be found in Appendix D. Replicating LPA results, the 6-profile model was the best-fitting model for the LTA.

The mean levels of human rights and climate change agreement for the 6-profile LTA can be found in Appendix D (see Table D4). The mean agreement levels for the human rights and climate change items were slightly different for the LPA model compared to the LTA model. This difference was expected as the first model fits data for only one time point while the second model includes additional data from two time points (Collins & Lanza, 2010). Importantly, the overall response patterns were consistent across the LTA and LPA profiles.

The latent transition patterns for moving across profiles or staying in the same profile over a one-year period are displayed in Table 6, and visually depicted in Figure 4. In this figure, arrows on the same profile with associated probabilities indicate the likelihood of staying in the given profile, and arrows between profiles reflect patterns of movement and

associated probability of movement between given profiles over the one-year period.

Transition probabilities above 10% are bolded.

As seen in Table 6, the *Rights-based believer and concerned* profile was the most

stable profile over time, with a probability of remaining in the same profile over one-year

being 0.805. The other five profiles were relatively unstable, with stabilities ranging from

0.403 for the *Rights-based denier and unconcerned* profile to 0.457 for the *Rights-based*

neutral believer and concerned profile and the *Rights-based undecided and unconcerned*

profile. Considering that the human rights scores were high across all profiles, these

transition probabilities suggest that people's climate change beliefs are more likely to shift

across time than support for human rights.

Given that five profiles were relatively unstable, large transitions occurred between

profiles over the one-year time period, so only the largest transition probabilities will be

discussed here. When examining these transitions, of note was that the largest transitions

occurred from profiles of lower climate change belief and concern scores to profiles of higher

climate change belief and concern scores. The largest transition probability (0.374) was from

the *Rights-based denier and unconcerned* profile, with the lowest scores across all three

climate items, into the *Rights-based undecided and unconcerned* profile, with approximate

mid-point scores on all three climate items. The *Rights-based denier and unconcerned* profile

also had a smaller chance of transitioning into the *Rights-based neutral believer and*

unconcerned profile (0.101) and was unlikely to transition into the other three profiles. In

turn, the *Rights-based undecided and unconcerned* profile only had a small chance of

transitioning to the *Rights-based denier and unconcerned* profile (0.056), and instead had the

greatest chance of transitioning into the *Rights-based neutral believer and unconcerned*

profile (0.274). The *Rights-based neutral believer and unconcerned* profile was most likely

to transition to the *Rights-based neutral believer and concerned* profile, which is a profile

with slightly greater concern scores (0.301). The *Rights-based neutral believer and concerned* profile was less likely to transition back to the *Rights-based neutral believer and unconcerned* profile (0.184), and was instead more likely to transition to the profile with the highest climate belief and concern scores, the *Rights-based believer and concerned* profile (0.258).

Given that the *Rights-based believer and concerned* profile was the most stable profile over the one-year period, the only transition probability of note was to the *Rights-based neutral believer and concerned* profile, a profile with slightly lesser climate belief scores (0.151). In contrast, the *Rights-based denier and unconcerned* profile and the *Rights-based anthropogenic denier and unconcerned* profile were the least stable profiles (0.403 and 0.405, respectively), and all of the profiles were unlikely to transition into them. However, the *Rights-based anthropogenic denier and unconcerned* profile was the most likely to transition into the *Rights-based neutral believer and concerned* profile (0.291).

Table 6

Transition Probabilities for Change in Profile Membership Across One Year (2013 – 2014)

| | | Time 2 | | | | | |
		Rights-based denier and unconcerned	Rights-based undecided and unconcerned	Rights-based anthropogenic denier and unconcerned	Rights-based believer and concerned	Rights-based neutral believer and unconcerned	Rights-based neutral believer and concerned
Time 1	Rights-based denier and unconcerned	0.403	0.374	0.034	0.030	0.101	0.059
	Rights-based undecided and unconcerned	0.056	0.457	0.025	0.049	0.274	0.139
	Rights-based anthropogenic denier and unconcerned	0.044	0.089	0.405	0.065	0.106	0.291
	Rights-based believer and concerned	0.002	0.009	0.006	0.805	0.027	0.151
	Rights-based neutral believer and unconcerned	0.016	0.170	0.019	0.087	0.408	0.301
	Rights-based neutral believer and concerned	0.012	0.065	0.024	0.258	0.184	0.457

Note. $N = 14,857$.

Figure 4

Transition Probabilities for the 6-Profile Model Across a one-year Period (2013-2014).
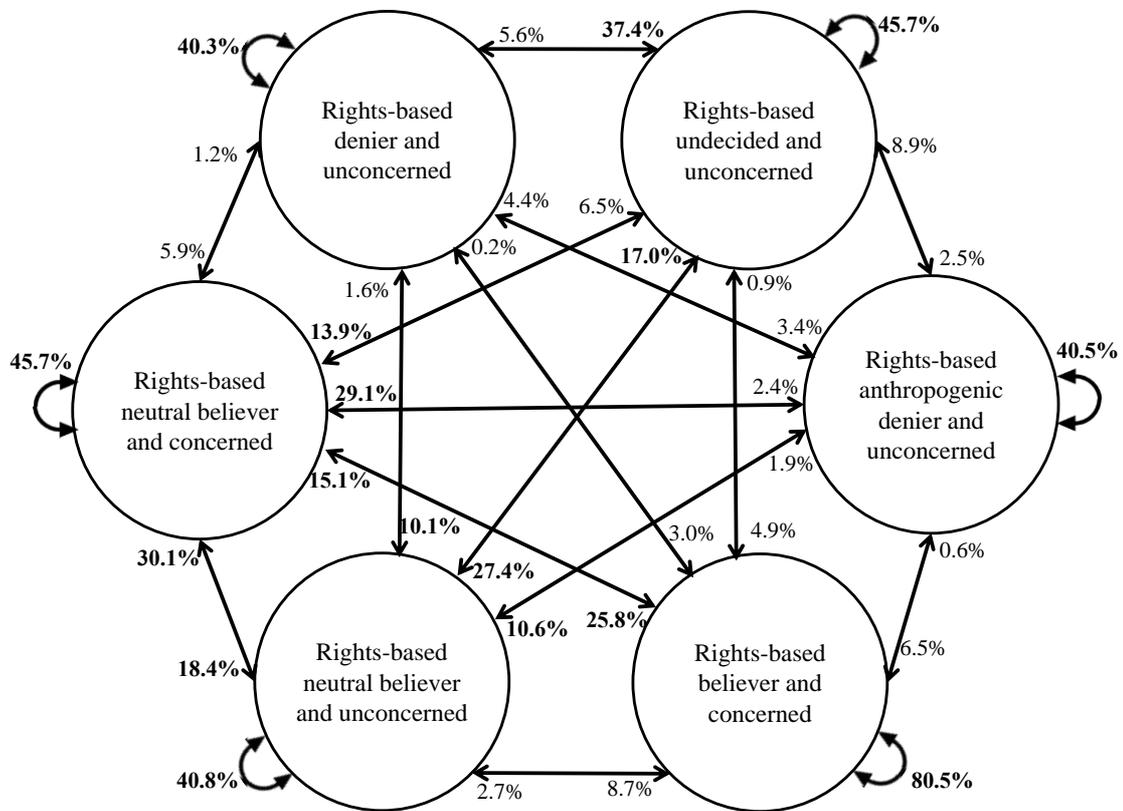
Discussion

Climate change is one of the greatest threats facing humanity. Given the number of human rights impacted by climate change, the United Nations has recommended that climate change action takes a human rights-based approach (OHCHR, 2015). However, to our knowledge, no empirical research has directly tested the relationship between human rights support and climate change beliefs, which would allow us to better understand whether a rights-based response would receive public support. To these ends, we used national probability data to examine the cross-sectional and longitudinal relationships between human rights attitudes and climate change beliefs, using both variable-centred and person-centred analyses ($N \approx 17,656$). Our measure of human rights and climate change was restricted to the

two human rights items and three climate change items included in the New Zealand Attitudes and Values Study. Here we discuss the key empirical findings of our analyses and the implications of our findings for a rights-based climate change response.

Longitudinal Associations Between Human Rights Support and Climate Change Beliefs

Our first research question was: Is there a longitudinal association between support for human rights and climate change beliefs? To answer this question, a variable-centred approach was used. The cross-lagged analysis revealed two main findings. First, we found that people who showed greater support for both human rights items (i.e., "Everyone has the right to food, clothing, housing and medicine, no matter what", "Everyone has the right to just and reasonable pay for the work they perform") at Time 1 were more likely to believe that climate change is real at Time 2. This association was bidirectional, in that people who believed that climate change is real at Time 1 were also more likely to support both types of human rights at Time 2. These longitudinal and bidirectional relationships remained significant even after accounting for demographic and other socio-psychological factors.

Second, although support for both types of human rights had a bidirectional relationship with the belief that climate change is real, only 'the right to food, clothing, housing, and medicine' item was bidirectionally associated with the belief that climate change is caused by humans and climate change concern. Thus, these results provide partial support for our initial hypothesis (H1) predicting a bidirectional, longitudinal relationship between support for human rights and climate change beliefs. Instead, we found that the relationship depends on the type of human rights and type of climate change belief being measured. All three climate change items had a bidirectional relationship with the human rights item focusing on more fundamental physical rights, but we only found a relationship between one climate change item with the human rights item focusing on economic rights.

Conceptually similar research has identified that human rights issues and environmental issues are considered to be of a similar level of importance (Barrows et al., 1981; Holsti, 1996). Thus, it is unclear why support for 'the right to just and reasonable pay', concerning economic rights, was only associated with one climate change item, and not all three, as we expected. One possible explanation for this finding is that there was a partial ceiling effect for the economic rights item. Our latent profile analysis indicated that this item had a higher mean score across subgroups than the mean score for 'the right to food, clothing, housing, and medicine', concerning physical rights. Thus, the economic rights item may be supported by most people and may not discriminate well between those who are more supportive of human rights in general, compared to those who are less supportive. However, it is important to note that the difference in mean score for the economic rights item ($M = 6.25$) compared to the physical rights item ($M = 5.95$) is small, in which support for both items is high. Moreover, examination of the multiple regression analysis with covariates (see Appendix C) indicates that certain groups of individuals are more likely to support the economic rights item than others. Thus, these arguments partially counter the possibility of a ceiling effect.

Another possible explanation for the finding that the economic rights item was only associated with one climate change item, is that support for this item may not translate to support for a wide range of human rights. Prior studies that have found a relationship between the importance of human rights issues and environmental issues did not measure any particular type of human rights. Instead, 'human rights' was measured as a general concept (Barrows et al., 1981; Holsti, 1996). In our study, the economic rights item covers only economic needs and only protects one societal group (i.e., employed individuals). In comparison, the physical rights item covers a range of distinct physical needs (i.e., food, clothing, housing, and medicine) and protects multiple societal groups, such as those who are

unemployed or homeless. It is possible that support for the economic rights item may not reflect support for other types of human rights, whereas the item regarding physical rights may have better reflected human rights support more generally. Thus, the relationship between human rights and climate change may be more related to support for a broad range of human rights, and supporting the economic rights of those who are employed may not translate to support for human rights in general.

Even though support for economic rights was only associated with one climate change item, people who support this human rights item are still likely to be more pro-environmental than those who do not support economic rights. Prior research has found that believing in the reality of climate change is important for pro-environmental behaviour, and support for 'the right to just and reasonable pay' is positively associated with the belief that climate change is real. Namely, one study found that believing that climate change is caused by humans and believing in the reality of climate change both independently predict support for public action and worry about climate change (van der Linden et al., 2019). However, believing that humans cause climate change was found to be more important for public action and worry than believing in the reality of climate change. In contrast, a study conducted in New Zealand found that believing in the reality of climate change was more important for engaging in pro-environmental behaviour and supporting climate change policies than believing that humans cause climate change (Sibley & Kurz, 2013). Thus, regardless of whether those who support economic rights believe that climate change is caused by humans or not, our results and prior research suggest that supporting economic rights is still likely to be associated with increased pro-environmentalism and climate policy support.

Our finding that both types of human rights predicted climate change beliefs to some extent aligns with research that has found a relationship between various humanitarian concerns and environmental beliefs. More specifically, prior research has found a relationship

between universalism, a value that reflects the desire to protect and care for the welfare of humanity and nature, is longitudinally predictive of lower climate change scepticism and greater perceived consequences of climate change (Prati et al., 2018). Other predictors of climate change beliefs and pro-environmental beliefs include having empathy for others (Pfattheicher et al., 2015), identifying with humanity (McFarland et al., 2019), and having an altruistic value orientation (Marshall et al., 2019). These findings suggest that being concerned about the welfare of others goes hand-in-hand with being concerned about the environment. Moreover, having a lack of concern for others and a preference for group-based dominance is negatively associated with pro-environmental behaviours and climate change beliefs, which further supports the idea that being concerned about others and the environment are related characteristics (Milfont et al., 2013). Overall, given that human rights are interwoven with other types of humanitarian concerns, it is not surprising that we found a relationship between both human rights items with the belief that climate change is real and support for physical rights with all three of the climate change items.

At the same time, we also contribute to the literature by showing that some humanitarian concerns, such as fulfilling economic rights, are associated with environmental concerns to a lesser degree than being concerned about fundamental physical rights. Importantly, we also contribute to the literature by showing that the relationship between humanitarian concerns and environmental concerns is bidirectional. That is, believing in climate change increases the likelihood of supporting human rights. This finding is similar to that of McFarland and Mathews (2005), who found that being concerned about a range of global issues (including environmental issues) positively predicts commitment to human rights, and negatively predicts restriction of human rights. Although McFarland and Mathews (2005) did not find that globalism predicted *support* for human rights, the finding that globalism predicted commitment to human rights indicates that people who are concerned for

wider global issues are more likely to be concerned for humanity (or committed to fulfilling human rights). The bidirectional relationship between humanitarian concerns and environmental concerns may simply reflect the degree to which an individual is concerned for the welfare of others, in which protecting the environment is a necessary part of protecting others. Considering our finding that item regarding economic rights was less related to climate change beliefs than physical rights, it is possible that people perceive economic rights to be less important for protecting humanity than protecting fundamental physical rights.

Overall, the results of our cross-lagged analysis provide novel evidence of a bidirectional relationship between support for human rights and climate change beliefs. Accordingly, our findings contribute to research examining how various humanitarian concerns predict environmental concerns by showing that support for both types of human rights are associated with the belief that climate change is real, but support for fundamental physical rights is associated with a wider range of climate change beliefs/concern than support for the item regarding economic rights.

Subgroups of Human Rights Support and Climate Change Beliefs Across the Population

For our second research question, we shifted to a person-centred approach to expand on the results of our cross-lagged analysis. We used a latent profile analysis to examine whether the relationship between human rights support and climate change beliefs differed across people. In doing so, we aimed to answer the question: Are there subgroups within the New Zealand population who produce unique response patterns to the human rights and climate change items? Results revealed that a six-profile solution of human rights support and climate change beliefs/concern best fit the data. These were: *rights-based believer and concerned* (35%), *rights-based neutral believer and concerned* (24.5%), *rights-based*

undecided and unconcerned (16.1%), *rights-based neutral believer and unconcerned* (14.4%), *rights-based denier and unconcerned* (6.3%), and *rights-based anthropogenic denier and unconcerned* (2.9%). Although we hypothesised (H2) that we would find at least two profiles with opposing views (one with lower scores on human rights and climate change, and one with higher scores on human rights and climate change), we did not find a profile of low human rights support.

Given that this study is, to our knowledge, the first to examine human rights support in New Zealand, our findings provide novel evidence that New Zealanders have high support for human rights—at least as measured by these two items. New Zealand's high support for human rights aligns with the findings of a cross-cultural survey revealing that support for human rights is high internationally (WorldPublicOpinion.org, 2008). However, research has found slight cross-cultural variations in the strength of support for specific 'domains' of human rights (McFarland, 2015). We found that the average level of support for the item regarding economic rights was slightly higher than the average level of support for the item regarding physical rights. Considering that country-specific events such as war and terrorism are influential of a country's support for certain human rights, New Zealand's slightly higher support for economic rights may reflect that New Zealand is an overall safe country, with low levels of conflict and crises that may put citizens' physical needs at risk (Institute for Economics & Peace, 2021). Thus, fulfilling physical rights may be perceived as less important than fulfilling economic rights. Despite these slight differences in support, our finding that the New Zealand population is supportive of human rights overall may be a reflection of New Zealand's arguably egalitarian and progressive culture (Kennedy, 2000).

Moreover, our finding that support for human rights was high across all profiles contributes to the variable-centred literature examining the predictors of human rights support. Prior variable-centred research has found that greater human rights support is more

likely among some people than others, such as women, individuals with a higher education level, individuals with a lower SDO, and individuals with a lower RWA (Cohrs et al., 2007; Crowson & DeBacker, 2008; Diaz-Veizades et al., 1995; Hertel et al., 2009; McFarland & Mathews, 2005; Moghaddam & Vuksanovic, 1990; Stellmacher et al., 2005). However, our person-centred analysis expands on these findings to show that human rights support remains high across the population, regardless of any relationships between human rights support and specific demographic and socio-psychological characteristics.

Turning now to climate change beliefs, while we found that the subgroups had differing climate change beliefs, it is important to mention that the largest subgroup of the population (35.8%) had high scores on all three climate change items, and another 38.9% of the population had neutral climate beliefs. Only 25.3% of the population had undecided climate change beliefs or a low belief in climate change. In our study and other cross-cultural studies, the proportion of the public that denies climate change is relatively small compared to the proportion of the public that believes in climate change (Crawley et al., 2020; Leiserowitz et al., 2009). However, compared to the United Kingdom and the United States, it appears that a larger proportion of the New Zealand population believes in or feels neutral about climate change and a smaller proportion of the public denies that climate change exists (Crawley et al., 2020; Leiserowitz et al., 2009). One explanation for the higher proportion of climate change believers and neutral believers is national identity. Prior research has identified that being 'clean and green' is part of New Zealander's national identity, and this environmental identity is predictive of climate change beliefs and pro-environmental behaviours (Milfont et al., 2020). Thus, New Zealander's national identity may contribute to a higher proportion of the population holding a strong or neutral belief in climate change. However, research has not yet examined cross-cultural differences in this 'clean and green' identity, so this is a tentative conclusion.

Beyond climate change beliefs, we also examined climate change concern. We found that the climate change concern score was lower than the climate change belief score within each subgroup. Thus, while people may strongly believe that climate change is real and that it is caused by humans, these beliefs do not necessarily lead to an equally high level of concern. This is an interesting finding as it highlights the 'disengagement' that people may experience around the issue of climate change. In other words, even though climate change is a significant threat to humanity, there are several factors that make it difficult for people to perceive it as a threat. For example, climate change is abstract in nature meaning the risks are unclear, it has 'future' consequences meaning that there are other 'more important' issues to worry about, and many countries have not yet experienced the more severe or concrete consequences of climate change (Weber, 2006). Factors such as these contribute to the fact that climate change is perceived to be a spatially distant, temporally distant, and socially distant threat (Milfont, 2010). As such, concern for climate change may not be equivalent to the strength of the belief in climate change, as it is not perceived to be an abstract threat.

In saying that, while climate change concern is not equally as high as the strength of belief in climate change, climate change concern still appears to be associated with climate change beliefs. Unsurprisingly, we found that climate change concern was greater for profiles that both believed in climate change and believed that climate change is caused by humans, and lower for profiles that were more sceptical of climate change. One profile was the exception to this association, however. The *Rights-based anthropogenic denier and unconcerned* profile (2.9%) held a strong belief that climate change is real but had the second-lowest climate change concern score. This low level of concern likely reflects that this profile does not believe that climate change is caused by humans. This finding aligns with prior research, which has found that believing in the anthropogenic cause of climate change causes more worry than believing that climate change is caused by natural processes

(Gregersen et al., 2020). Thus, while climate change concern appears to be positively associated with the strength of belief in climate change, believing that climate change is caused by humans may be the 'driving force' behind this concern.

Beyond identifying profiles of different beliefs, we conducted a three-step multinomial regression analysis to examine the demographic and socio-psychological predictors of profile membership. Given that human rights support was high for all profiles, here we discuss the predictors of profile membership in terms of climate change beliefs/concern. Of the demographic predictors, ethnicity was the most consistent predictor of group membership. New Zealand Europeans were less likely to be a member of the profile of the highest beliefs in climate change relative to the other profiles, and in contrast, Māori were more likely to be a member of the profile of the highest beliefs in climate change relative to the other profiles. These results align with prior research showing that Māori cultural identity is associated with a greater connection to the environment and pro-environmental attitudes (Cowie et al., 2016; Lockhart et al., 2019; Tassell-Matamua et al., 2021). Furthermore, compared to the profile of the highest belief in climate change, we found that people with a lower education were more likely to be a member of three profiles of lower climate change beliefs, and men were more likely to be a member of two profiles of lower climate change beliefs relative to the profile of high climate change beliefs. These findings are consistent with the results of prior variable-centred research, in which men and individuals with a lower education are less likely to believe in climate change (Hornsey et al., 2016; Milfont et al., 2015).

Excluding ethnicity, we found that in general, socio-psychological characteristics appeared to be more consistently associated with subgroup membership, with greater effect sizes, compared to the demographic characteristics. This finding aligns with the findings of a meta-analysis, showing that the effect sizes of demographic variables on climate change

beliefs are smaller than that of socio-psychological variables (Hornsey et al., 2016). In particular, we found that people with a high SDO, a high RWA, and a high conservative political orientation were unlikely to be a member of the profile with the highest beliefs in and concern about climate change. These findings are consistent with prior research examining the psychological predictors of climate change beliefs (Hornsey et al., 2016; Milfont et al., 2015). Moreover, the results align with the "conservative white male effect" found in other studies, which refers to the way in which conservative white men are more likely to be sceptical of climate change and be less worried about environmental problems than other people (Jylhä et al., 2016; McCright & Dunlap, 2011; Milfont, Abrahamse, et al., 2021; Milfont et al., 2015). In terms of why these ideological characteristics are so strongly related to climate change beliefs, research suggests that an individual's ideologies influence a 'motivated reasoning' process that occurs in response to new climate change information (Hornsey, 2021). People who support free-market ideology, individualism, and social hierarchies—ideologies that are closely associated with SDO, RWA, and political conservatism—have a motivation to believe that climate change mitigation is unnecessary. In turn, individuals who support these ideologies interpret climate change information in a biased way to support their desired conclusion. As such, individuals who hold these ideologies are less likely to engage in pro-environmental behaviour or hold pro-environmental beliefs. To combat this process of motivated reasoning, climate change messages must be framed in a way that aligns with the ideologies of those most likely to deny climate change.

Stability of Human Rights Support and Climate Change Belief Subgroups

For our third research question, we extended the findings from the latent profile analysis through the use of a latent transition analysis. In doing so, we aimed to examine whether the subgroups we identified remained stable over one year. Similar to the latent

profile analysis, we found that a six-profile model provided the best fit to the data. The profiles found in the latent transition analysis neatly corresponded with those found in the latent profile analysis. Despite hypothesising that the subgroups would remain stable (H3), we did not find evidence to support this. Instead, we found that the only stable profile was the group of the highest climate beliefs/concern (*Rights-based believer and concerned*), with over 80% of respondents remaining in this profile after a year. Compared to the *Rights-based believer and concerned* profile, the other profiles had substantially lower stabilities ranging from approximately 40% to 45%. Of all of these profiles, the *Rights-based denier and unconcerned* profile was the most likely to change over time, with a stability of 40.3%. This profile had the lowest scores on each climate change item compared to every other profile and was most likely to transition to a profile of undecided climate change beliefs (*Rights-based undecided and unconcerned*). Thus, people who highly believe in climate change, highly believe that it is caused by humans, and are concerned for climate change, are far more likely to hold these beliefs over time compared to any other climate change belief patterns. The high stability for those who believe in climate change, and low stability for those who do not, may be due to the fact that there is increasing media coverage of climate change (Schmidt et al., 2013). This media coverage may reaffirm the beliefs of those who believe in climate change and cause those who do not believe in climate change to question their beliefs.

Another explanation for these belief stabilities is that it reflects the interaction between political orientation and exposure to scientific cues about climate change (i.e., exposure to the scientific consensus on climate change). Political orientation is a consistent predictor of belief in climate change. Research conducted in the United States has found that individuals with a right-wing political affiliation have more unstable climate change beliefs than those with a left-wing political affiliation (Jenkins-Smith et al., 2020). Similarly, we

found that politically conservative individuals were unlikely to be a member of the most stable profile, and politically liberal individuals were more likely to be a member of the most stable profile. Research has found that exposure to scientific cues influences the stability of climate change beliefs. More specifically, exposure to and acknowledgement of scientific cues about climate change strengthens the beliefs of those with a left-wing political affiliation and weakens the beliefs of those with a right-wing political affiliation (Jenkins-Smith et al., 2020). The interaction between scientific cues and political orientation is likely a result of the fact that scientific cues about climate change are congruent with left-wing political beliefs but incongruent with right-wing political beliefs. Thus, scientific cues may have a role in stabilising the beliefs of those who believe in climate change and destabilising the beliefs of those who do not believe in climate change.

However, it is important to note that the relationship between political orientation and stability of climate change beliefs may also reflect a ceiling effect. Given that climate change beliefs are increasing over time (Milfont et al., 2017; Milfont, Zubielevitch, et al., 2021), politically liberal individuals who are more likely to believe in climate change have less room to move 'upwards' in their climate change beliefs over time, compared to politically conservative individuals. Despite the possible influence of political orientation on belief stability, our results provide hopeful evidence that the belief in climate change is stable and that climate change denial can be changed.

Regarding which profiles the participants transitioned to, we found that the largest transitions occurred from profiles of lower beliefs/concern about climate change to profiles of higher beliefs/concern about climate change. The overall pattern that people were likely to move to profiles of higher climate beliefs/concern after a year aligns with variable-centred research showing that the public's belief in climate change is steadily increasing over time in New Zealand, across age and gender (Milfont, Zubielevitch, et al., 2021). Prior research has

found that belief in climate change has been increasing in developed countries since approximately 2008 (Capstick et al., 2015). This increase in belief in climate change from 2008 onwards aligns with our findings, particularly in that our data is from 2013-2014. As discussed above, the increasing beliefs in developed countries such as New Zealand may be the result of factors such as increased media attention on climate change, in which people are being exposed to the risks of climate change more often (Schmidt et al., 2013), or greater exposure to the scientific consensus on climate change (Jenkins-Smith et al., 2020).

Taken together, the results of our latent transition analysis extend on the results of our latent profile analysis by demonstrating that an individual's climate change beliefs are likely to change over a year. The exception to this pattern is if the respondent already highly believes in and is concerned about climate change, in which case they are likely to continue to hold these beliefs over time. Thus, our findings suggest that climate change denial is not as stubborn of a belief as it may appear in cross-sectional research. Moreover, our results also show that an individual's support for human rights is likely to remain high regardless of how their climate change beliefs may change. However, it is important to note that even if respondents remained in the same subgroup after a year, it does not necessarily mean that their beliefs did not fluctuate throughout the year (Collins & Lanza, 2010). Thus, stability must be interpreted with caution.

Implications for a Rights-Based Climate Change Response

Our research has important practical implications for a rights-based response. Given that public beliefs are associated with support for government policies and individual pro-environmental behaviour (Bord et al., 2000; Sibley & Kurz, 2013), a rights-based response must align with the beliefs of the public to ensure it gains widespread support. Considering the importance of public beliefs in climate change action, the results of our cross-lagged analysis identify beliefs and attitudes that a rights-based response should target to increase

public support. For one, we show that increasing support for human rights also increases the likelihood of believing in climate change. We also show that this relationship is bidirectional, which indicates that increasing belief in climate change is also more likely to increase support for human rights. Targeting either one of these areas in climate change action, for example through promoting positive human rights attitudes or promoting education around climate change, is likely to strengthen support for a rights-based climate change policy. Importantly, however, our results indicate that a large majority of the New Zealand population already believes in climate change and supports human rights. Moreover, the proportion of the public that would likely be receptive to a rights-based response is growing over time.

Along with finding that a rights-based response aligns with the beliefs of a large proportion of the public, a rights-based response also has the potential to gain support from a greater proportion of people compared to prior climate change responses. Although not the focus of our study, research examining the relationship between framing and climate change offers insight into how a rights-based response may increase public support. In the context of climate change, framing refers to the way in which the issue is communicated to the public, in which some parts are made more salient than others to shape public views (Badullovich et al., 2020). Research has found that framing climate change as a public health issue elicits hopeful reactions to the benefits offered by climate change responses (Myers et al., 2012). In comparison, framing climate change as a primarily environmental issue was more likely to elicit angry reactions to climate change responses. Given that human rights are fundamental to public health, it is possible that framing climate change as a human rights issue will elicit more positive emotional responses in the public compared to climate change responses that are framed as an environmental issue.

Our results provide further hope that a rights-based response has the potential to gain greater public support by showing that the New Zealand public is highly supportive of human rights regardless of their climate change beliefs. Thus, a rights-based response may reach subgroups in the population that have previously been resistant to climate change responses—namely, the *Rights-based denier and unconcerned* profile (n = 1120, 6.3%), and the *Rights-based anthropogenic denier and unconcerned* profile (n = 520, 2.9%). In other words, even those with low belief and concern in climate change may be willing to support such a response when it is framed as a human rights issue, particularly due to high public support for human rights in New Zealand.

Although a rights-based response has the potential to gain greater public support, certain ideologies that do not align with a rights-based response. To illustrate, SDO is a socio-psychological trait is positively associated with climate change denial and negatively associated with pro-environmental behaviour (Jylhä & Akrami, 2015; Milfont, Bain, et al., 2017; Milfont et al., 2020; Stanley et al., 2019). SDO measures a preference for in-group dominance and social hierarchy (Pratto et al., 1994), and covariate testing (see Appendix C) revealed that SDO negatively predicts support for both types of human rights. Similarly, prior research has found that SDO negatively predicts commitment to and endorsement of human rights and positively predicts restriction of human rights (McFarland & Mathews, 2005). Indeed, research indicates that climate change denial in people with high SDO is partly motivated by the desire to promote social hierarchies (Jylhä & Akrami, 2015). As such, it is possible that the human rights element of a rights-based climate change response would not align with the preference for inequality demonstrated by people of a higher SDO.

Along with SDO, there are a number of other ideologies that may conflict with support for a rights-based response. For example, climate change mitigation conflicts with the preference for lack of state regulation in those who hold free-market ideologies, which

ultimately leads to biased conclusions about climate change and a lack of pro-environmental behaviour (Hornsey, 2021). One way to counter the potential lack of support from individuals who hold conflicting ideologies is by presenting climate change mitigation strategies in a way that does not threaten perceived social hierarchies and systems. Research has shown that people who justify the status quo are more likely to have pro-environmental intentions when climate change mitigation is presented as a way of serving the "American way of life" (Feygina et al., 2009). Thus, a rights-based response must be framed in a way that aligns with conflicting ideologies if it is to receive support from people less likely to believe in climate change or support human rights.

Our results provide evidence that, at least in the context of New Zealand, a rights-based climate change response would likely be met with widespread public support. Moreover, a rights-based response has the potential to gain support from a wider demographic of the population than prior climate responses, particularly if it is presented in a way that does not threaten perceived social hierarchies and systems. Along with being met with public backing, if implemented successfully, a rights-based response would provide a novel way to address the consequences of climate change while protecting the human rights of vulnerable populations (OHCHR, 2015). Thus, from both a psychological and humanitarian standpoint, a rights-based response provides a promising approach to successful climate change mitigation and adaptation strategies.

Limitations and Future Research

Like all research, our studies have important limitations. One limitation is that our measure of human rights and climate change was restricted to the individual items included in the New Zealand Attitudes and Values Survey. Considering that we found that the relationship between human rights and climate change differed depending on the item being measured, we may have been able to draw more general conclusions if we were able to

include other types of human rights. For example, Hertel et al. (2009) found that men were more likely to support the right to freedom of speech than women, and we found that men are more likely to be in profiles of lower climate change beliefs than women. These findings indicate that other human rights could have a different relationship with climate change beliefs, such as a negative relationship, compared to the items we were restricted to using. Future research should examine the relationship between support for a broader range of human rights, such as the right to freedom of speech, with climate change beliefs. Measuring support for other variations of human rights with climate change beliefs would allow us to understand better which types of human rights are more related to climate change beliefs than others, and why. In addition, this would allow us to understand which human rights should be targeted when communicating a rights-based response to the public.

Moreover, other research uses multi-item scales to measure human rights attitudes, which would provide more of an understanding about the relationship between human rights attitudes and climate change beliefs. For example, our human rights items were adapted from the Human Rights Questionnaire (Diaz-Veizades et al., 1995). The item equivalent to 'the right to just and reasonable pay' fell into a factor of rights equality. The item equivalent to 'the right to food, clothing, housing, and medicine' fell into a factor of rights concerning social security. However, given that we only measured two individual items, we cannot draw conclusions about the relationship between more general attitudes towards human rights, such as attitudes towards equality or social security, with climate change beliefs/concern. Thus, future research should consider using multi-item scales to measure human rights support, such as the Human Rights Questionnaire (Diaz-Veizades et al., 1995) and the three-factor model (Human Rights Endorsement, Commitment, and Restriction) developed by McFarland & Mathews (2005). Using multi-item scales will allow for a better understanding as to whether the relationship between human rights support and climate change beliefs is

explained by attitudes towards more general areas of human rights, such as attitudes towards equality, and whether the relationship differs across different facets of human rights attitudes such as commitment to, endorsement of, and restriction of, human rights.

Despite the limitations associated with our measure of human rights, future research should still explore why we may have found that 'the right to just and reasonable pay' was only associated with one climate change item but that 'the right to food, clothing, housing, and medicine' was associated with all three. One possible area to look into is the role of value orientations in the relationship between human rights support and climate change beliefs. For example, prior research has found that universalism is associated with human rights support (Cohrs et al., 2007). Research has also shown that universalism, which reflects the desire to protect others beyond one's immediate social circle (i.e., the out-group), is more important for predicting climate change beliefs than benevolence, which reflects the desire to protect others within one's immediate social circle (i.e., the in-group) (Prati et al., 2018). It may be the case that, for example, support for 'the right to just and reasonable pay' reflects a desire to protect the rights of those in the in-group (e.g., employed individuals), whereas support for 'the right to food, clothing, housing, and medicine' reflects a desire to protect those in both the in-group and out-group (e.g., those who are homeless). However, this is a tentative conclusion. Future research should formally test the role of value orientations in the relationship between human rights support and climate change to gain insight into why certain human rights are associated with more climate change beliefs/concern than others.

Regarding the over-time change found in the latent transition analysis, we found that all subgroups, except the subgroup that strongly believed in climate change, were relatively unstable over time. Future research should examine first if this instability replicates across longer time gaps, along with the mechanisms as to why some people would hold their beliefs over time and why others would not. For example, prior research conducted in the United

States has found that exposure to scientific cues predicts the stability of climate change

beliefs differently across different political orientations (Jenkins-Smith et al., 2020). Future

research would benefit from examining whether scientific cues predict belief stability after

controlling for political orientation influences and whether scientific cues predict the belief

stability of different political orientations cross-culturally. If we know why some people hold

their beliefs over time and why others change their beliefs over time then we will be able to

more effectively target people who are sceptical of climate change in climate change

mitigation and adaptation strategies.

A criticism that may be raised about the validity of our findings is that our measure of

support for human rights might not reflect a genuine commitment to human rights. As

discussed by McFarland (2015), self-rated agreement with human rights may be a stronger

reflection of social norms than a genuine commitment to or concern for human rights. To

illustrate, McFarland and Mathews (2005) found that although 61% of respondents rated the

foreign policy goal of 'promoting and defending human rights abroad' as important or very

important, only 15% were willing to use the American military 'more often' or 'much more

often' to stop mass killings. Thus, there appears to be a difference between endorsing human

rights and being committed to human rights, and our results may have differed if we had

measured commitment to human rights. This limitation also has implications for a rights-

based response. Although we identified that a rights-based response aligns with the beliefs of

the widespread public and that public beliefs are related to policy support, this does not

guarantee that the public would support a rights-based response in reality. For example,

respondents in the low climate belief subgroup may not be committed to supporting human

rights when human rights are placed in the context of a climate change response. However, it

is important to note that research has found that endorsement and commitment to human

rights are correlated, which affords some confidence that the results reflect a commitment to human rights (Cohrs et al., 2007).

Conclusion

To conclude, the present research is the first to test the empirical relationships between human rights support and climate change beliefs. We use both cross-sectional and longitudinal data and draw on both variable-centred and person-centred approaches to illuminate their relationships. We find a longitudinal, bidirectional relationship between the belief that climate change is real and support for two types of human rights. We also show that overall, support for 'the right to food, clothing, housing, and medicine' is associated with more types of climate beliefs/concern than support for 'the right to just and reasonable pay'. We extend these findings to examine how these relationships may vary across the population and show that human rights support remains high across six subgroups while climate change beliefs differ. Finally, we found that a large proportion of the population either strongly believes in or feels neutral about climate change, and that people are increasing their climate beliefs over time. Theoretically, our findings contribute to the human rights support and climate change beliefs literature by showing that these concepts are partially, positively predictive of each other, in that some human rights are associated with more climate change beliefs/concern than others. Practically, our findings provide promising evidence that a rights-based response would be met with widespread public support in New Zealand.

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Appendix A

Table A1

Descriptive Statistics for the Time 1 Measures of Human Rights, Climate Change, and Socio-

Psychological Covariates

Variable	Minimum	M	Maximum	SD
Human rights				
"Everyone has the right to just and reasonable pay for the work they perform"	1	6.28	7	1.01
"Everyone has the right to food, clothing, housing and medicine, no matter what"	1	6.11	7	1.30
Climate change				
"Climate change is real"	1	5.60	7	1.58
"Climate change is caused by humans"	1	5.07	7	1.69
"I am deeply concerned about climate change"	1	4.59	7	1.73
SDO	1	2.34	7	0.88
RWA	1	3.34	7	1.13
Political Orientation	1	3.64	7	1.28

Note. $N = 17{,}656$. M = mean. SD = standard deviation. SDO = Social dominance orientation. RWA = Right-wing authoritarianism.

Appendix B

Table B1

Correlations for the Time 1 and Time 2 Human Rights and Climate Change Items, Using the Longitudinal Sample

	1	2	3	4	5	6	7	8	9	10
1. Just and reasonable pay T1	-									
2. Food, clothing, housing and medicine T1	.28***	-								
3. CC is real T1	.15***	.19***	-							
4. CC is caused by humans T1	.12***	.20***	.68***	-						
5. CC concern T1	.11***	.20***	.64***	.70***	-					
6. Just and reasonable pay T2	.38***	.24***	.13***	.10***	.10***	-				
7. Food, clothing, housing, and medicine T2	.24***	.53***	.20***	.21***	.21***	.31***	-			
8. CC is real T2	.14***	.19***	.71***	.59***	.58***	.20***	.24***	-		
9. CC is caused by humans T2	.11***	.20***	.58***	.76***	.61***	.13***	.23***	.70***	-	
10. CC concern T2	.11***	.19***	.58***	.63***	.74***	.14***	.23***	.67***	.70***	-

Note. $N = 13,291$. Human rights and climate change items were measured on a scale of 1-7. T1 = Time 1 (2013). T2 = Time 2 (2014). CC =

Climate Change. SDO = Social Dominance Orientation. RWA = Right-wing Authoritarianism.

*p < .05; **p < .01; ***p < .001.

Table B2

Correlations Between the Main Human Rights and Climate Change Measures with the Demographic and Socio-psychological Covariates at

Time 1, Using the Longitudinal Sample

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Just and reasonable pay	-													
2. Food, clothing, housing and medicine	.28***	-												
3. CC is real	.15***	.19***	-											
4. CC is caused by humans	.12***	.20***	.68***	-										
5. CC concern	.11***	.20***	.64***	.70***	-									
6. Age	.03***	-.08***	-.11***	-.14***	-.03**	-								
7. Gender	-.08***	-.17***	-.07***	-.11***	-.09***	.13***	-							
8. NZ European	.06***	-.02***	-.05***	-.09***	-.08***	.09***	-.01	-						
9. Māori	-.02	.05***	.05***	.07***	.07***	-.06***	-.03***	-.23***	-					
10. Income	.00	-.07***	.01	.01	-.02	-.07***	.07***	.07***	-.07***	-				
11. Education level	.01	.03**	.08***	.09***	.07***	-.08***	-.01	-.03***	-.03***	.08***	-			
12. Political Orientation	-.10***	-.17***	-.29***	-.29***	-.27***	.13***	.05***	-.04***	-.01	-.02*	-.09***	-		
13. SDO	-.31***	-.37***	-.29***	-.27***	-.28***	.09***	.18***	-.04***	.02	.03**	-.05***	.30***	-	
14. RWA	-.10***	-.09***	-.23***	-.20***	-.17***	.14***	-.06***	-.16***	.05***	-.11***	-.08***	.50***	.19***	-

Note. $N = 13,291$. All items measured at time 1. Human rights and climate change items were measured on a scale of 1-7. CC = Climate Change.

SDO = Social Dominance Orientation. RWA = Right-wing Authoritarianism.

*p < .05; **p < .01; ***p < .001.

Appendix C

Cross-lagged panel analysis with covariates

For our second cross-lagged analysis, we included 8 covariates in the model. These were: age, gender, New Zealand European, Māori, income, education, conservative political orientation, SDO, RWA. Based on similar criteria reported in the main document, this cross-lagged model with covariates had a poor fit to the data, $\chi^2(49) = 16807.08$, $p < .001$; CFI = 0.77; RMSEA = .16, 90% CI [0.16,0.16], SRMR = .12. As discussed in the main results section, although these statistics showed poor fit, global model fit measures are inadequate at identifying person-level misfit in structural equation modelling (Little, 2013). Thus, adding covariates to the model is expected to decrease the model fit statistics, but does not yield the model theoretically uninterpretable.

The results of the cross-lagged analysis after including socio-psychological and demographic characteristics are reported in Table C1. All pathways between variables remained the same as in the model without the covariates. Both of the human rights items were relatively unstable over time (β's > 0.34, $p < .001$), whereas the three climate change items were slightly more stable than the human rights items (β's > 0.57, $p < .001$). As was found in the model without the covariates, the cross-lagged relationship between human rights and climate change was dependent on the specific items being measured. A full bidirectional association was observed for the human rights item 'right to food, clothing, housing and medicine' with each of the climate items, while the human rights item 'just and reasonable pay' had a bidirectional association with only 'climate change is real'.

Age

The relationships between the covariates and the climate change and human rights items are displayed in Table C2. Age positively predicted support for 'just and reasonable pay' ($\beta = 0.07$, $p < .001$), and positively predicted greater concern for climate change ($\beta = $

0.04, $p < .001$). However, age negatively predicted support for the 'right to food, clothing, housing, and medicine' (β = -0.03, $p < .01$), negatively predicted the belief that climate change is real (β = -0.04, $p < .001$), and negatively predicted the belief that climate change is caused by humans (β = -0.07, $p < .001$). In other words, older people are more likely to support 'just and reasonable pay', and be concerned about climate change than younger people. However, younger people are more likely to support the right to food, clothing, housing and medicine, more likely to believe in climate change, and more likely to believe that climate change is caused by humans.

Gender

Women were more likely than men to support 'just and reasonable pay' (β = -0.04, $p < .001$), and were more likely to support 'the right to food, clothing, housing and medicine' (β = -0.10, $p < .001$). Similarly, women were more likely than men to believe that climate change is real (β = -0.02, $p < .01$), to have greater concern for climate change (β = -0.05, $p < .001$), and to believe that climate change was caused by humans (β = -0.06, $p < .001$).

Ethnicity

In terms of human rights, New Zealand European ethnicity positively predicted support for 'just and reasonable pay' (β = 0.02, $p < .05$), but was not significantly associated with support for 'the right to food, clothing, housing and medicine' (β = -0.03, $p < .01$). In contrast, Māori ethnicity did not significantly predict support for 'just and reasonable pay', but positively predicted support for 'the right to food, clothing, housing and medicine' (β = 0.04, $p < .001$). In terms of climate change, New Zealand European ethnicity negatively predicted the belief that climate change is real (β = -0.07, $p < .001$), concern for climate change (β = -0.09, $p < .001$), and the belief that climate change is caused by humans (β = -0.09, $p < .001$). In contrast, Māori ethnicity positively predicted support for all three climate items ($\beta's$ > 0.04, $p's$ < .001). In other words, New Zealand Europeans were more likely

than Māori to support 'just and reasonable pay', but less likely than Māori to support 'the right to food, clothing, housing and medicine', and less likely than Māori to support all three climate items.

Income

A lower income predicted support for 'the right to food, clothing, housing and medicine' ($\beta = -0.05$, $p < .001$), but income was not significantly related to any of the other human rights or climate change variables.

Social Dominance Orientation (SDO)

Higher SDO negatively predicted support for 'just and reasonable pay' ($\beta = -0.30$, $p < .001$), and negatively predicted support for 'the right to food, clothing, housing and medicine' ($\beta = -0.33$, $p < .001$). Additionally, higher SDO negatively predicted the belief that climate change is real ($\beta = -0.21$, $p < .001$), concern for climate change ($\beta = -0.21$, $p < .001$), and the belief that climate change is caused by humans ($\beta = -0.18$, $p < .001$). In other words, individuals who were high on SDO were less likely to support human rights and climate change.

Right-Wing Authoritarianism (RWA)

Higher RWA negatively predicted support for 'just and reasonable pay' ($\beta = -0.06$, $p < .001$), but did not significantly predict support for 'the right to food, clothing, housing, and medicine'. In terms of the climate change items, higher RWA negatively predicted the belief that climate change is real ($\beta = -0.12$, $p < .001$), concern for climate change ($\beta = -0.06$, $p < .001$), and the belief that climate change is caused by humans ($\beta = -0.07$, $p < .001$). In other words, individuals who were high on RWA were less likely to support 'just and reasonable pay', and less likely to believe in climate change.

Conservative political Orientation

In terms of human rights support, conservativism negatively predicted support for the 'right to food, clothing, housing, and medicine' (β = -0.06, p < .001), but did not have a significant relationship with 'just and reasonable pay'. In terms of climate change, conservativism negatively predicted the belief that climate change is real (β = -0.16, p < .001), concern for climate change (β = -0.18, p < .001), and the belief that climate change is caused by humans (β = -0.19, p < .001). In other words, conservative individuals are less likely to support for the 'right to food, clothing, housing, and medicine', and less likely to believe in climate change, compared to more liberal individuals.

Education

Education did not have a significant relationship with either of the human rights items. In terms of climate change, higher education positively predicted support for the belief that climate change is real (β = 0.04, p < .001), concern for climate change (β = 0.05, p < .001), and the belief that climate change is caused by humans (β = 0.04, p < .001). In other words, individuals with a higher education were more likely to believe in climate change.

Table C1

Cross-Lag Effects of Human Rights and Climate Change Items at Time 1 With Human Rights and Climate Change Items at Time 2, after

controlling for socio-psychological and demographic covariates

	Just and reasonable pay T2		Right to food, clothing, housing, and medicine T2		Climate change is real T2		Climate change is caused by humans T2		Climate change concern T2	
	B(SE)	*β*	*B(SE)*	*β*	*B(SE)*	*β*	*B(SE)*	*β*	*B(SE)*	*β*
Just and reasonable pay T1	0.31(0.01)	0.34***	0.12(0.01)	0.10***	0.04(0.01)	0.03***	-0.00(0.01)	-0.00	0.01(0.01)	0.01
Right to food, clothing, and housing T1	0.10(0.01)	0.14***	0.47(0.01)	0.48***	0.03(0.01)	0.03***	0.04(0.01)	0.04***	0.03(0.01)	0.03***
Climate change is real T1	0.04(0.01)	0.07***	0.03(0.01)	0.04**	0.48(0.01)	0.57***	0.09(0.01)	0.10***	0.14(0.01)	0.14***
Climate change is caused by humans T1	-0.01(0.01)	-0.02	0.03(0.01)	0.04***	0.12(0.01)	0.15***	0.57(0.01)	0.65***	0.15(0.01)	0.17***
Climate change concern T1	0.01(0.01)	0.01	0.04(0.01)	0.06***	0.12(0.01)	0.16***	0.12(0.01)	0.14***	0.52(0.01)	0.60***

Note. *N* = 13,291. T1 = Time 1. T2 = Time 2. *B* = unstandardized regression coefficient. *SE* = standard error. *β* = standardized regression coefficient.

$\chi^2(49)$ = 16807.08, *p* < .001 ; CFI = 0.77; RMSEA = .16, 95% CI [0.16,0.16]; SRMR =.12.

p < .05; **p* < .01; ***p* < .001.

Table C2

Multiple Regression Analysis Using Demographic and Socio-psychological Covariates to Predict Human Rights and Climate Change Items at

Time 1

	Just and reasonable pay T1		Right to food, clothing, housing, and medicine T1		Climate change is real T1		Climate change is caused by humans T1		Climate change concern T1	
	B(SE)	*β*	*B(SE)*	*β*	*B(SE)*	*β*	*B(SE)*	*β*	*B(SE)*	*β*
Age	0.01(0.00)	0.07***	-0.00(0.00)	-0.03**	-0.01(0.00)	-0.04***	-0.01(0.00)	-0.07***	0.01(0.00)	0.04***
Gender	-0.08(0.02)	-0.04***	-0.27(0.02)	-0.10***	-0.08(0.03)	-0.02**	-0.22(0.03)	-0.06***	-0.18(0.03)	-0.05***
New Zealand European	0.07(0.03)	0.02*	-0.07(0.04)	-0.02	-0.38(0.05)	-0.07***	-0.54(0.05)	-0.09***	0.54(0.05)	-0.09***
Māori	-0.01(0.03)	-0.00	0.16(0.03)	0.04***	0.22(0.04)	0.04***	0.29(0.05)	0.06***	0.30(0.05)	0.06***
Income	0.00(0.00)	0.01	-0.01(0.00)	-0.05***	0.00(0.00)	0.00	0.00(0.00)	0.01	-0.00(0.00)	-0.01
Education level	0.00(0.00)	0.00	0.00(0.00)	0.01	0.01(0.00)	0.04***	0.01(0.00)	0.05***	0.01(0.00)	0.04***
Conservative political orientation	0.01(0.01)	0.01	-0.06(0.01)	-0.06***	-0.19(0.01)	-0.16***	-0.25(0.01)	-0.19***	-0.24(0.01)	-0.18***
SDO	-0.34(0.01)	-0.30***	-0.49(0.01)	-0.33***	-0.38(0.02)	-0.21***	-0.35(0.02)	-0.18***	-0.42(0.02)	-0.21***
RWA	-0.05(0.01)	-0.06***	-0.00(0.01)	-0.00	-0.17(0.01)	-0.12***	-0.11(0.02)	-0.07***	-0.10(0.02)	-0.06***

Note. N = 13,291. T1 = Time 1. All covariates measured at Time 1. *B* = unstandardized regression coefficient. *SE* = standard error. *β* = standardized regression coefficient.

SDO = Social Dominance Orientation. RWA = Right wing authoritarianism. $\chi^2(49)$ =16807.08, *p* < .001 ; CFI = 0.77; RMSEA = .16, 95% CI [0.16,0.16]; SRMR =.12.

p < .05; **p* < .01; ***p* < .001

Appendix D

Latent Transition Analysis Model Fit

Model fit statistics for the LTA models are presented in Table D1. Results for the 7-profile and 8-profile models yielded model nonidentification, and thus were not included in the analysis. The 5-profile model had the greatest entropy (0.978) than the alternative models, followed by the 6-profile model (0.971). Both models had significantly greater entropy than the alternative models, indicating that for both models, greater than 97% of respondents were correctly classified into profiles. Although the 5-profile model could be preferable due to parsimony, the 6-profile model has showed a better fit to the data after taking all the fit indicators into consideration, and the 6-profile results replicated the results of the LTA. Additionally, for both time points of the 6-profile model, there was high levels of certainty in correct classification for all of the profiles. These values are displayed in Table D2 and Table D3 (for Time 1 and Time 2, respectively). These results show that, for example, individuals assigned to Profile 1 at Time 1 had a 98% chance of being correctly classified in this profile, and a 1% chance of being incorrectly classified in Profile 5. The levels of certainty in correct classification in the 6-profile model were also high at Time 2 (i.e., above 88%). Overall, the constrained 6-profile model provided the better fitting and conceptually clear solution. The item means for the final constrained 6-profile model are displayed in Table D4. The means of each item were similar for the LTA profiles as they were for the LPA profiles.

Additionally, Figure D1 shows the proportion of respondents in each profile for both time points. The largest profile was the *Rights-based believer and concerned* profile, and this profile increased in members over time. The second largest profile was the *Rights-based neutral believer and concerned* profile, which also increased in members over time. The smallest profiles were the *Rights-based anthropogenic denier and unconcerned* profile and

the *Rights-based denier and unconcerned* profile, and both profiles decreased in members

over time.

Table D1

Model fit Statistics for the Models Ranging From 2-6 Profiles of the Latent Transition

Analysis

Profiles	Log Likelihood	AIC	BIC	aBIC	Ent
2 profiles	-229720.933	459487.866	459662.809	459589.717	0.887
3 profiles	-221197.737	442461.475	442712.480	442607.609	0.893
4 profiles	-217809.566	435709.133	436051.413	435908.407	0.907
5 profiles	-210706.894	421531.789	421980.556	421793.059	0.978
6 profiles	-206308.326	412766.652	413337.119	413098.775	0.972

Note. AIC = Akaike Information Criterion. BIC = Bayesian Information Criterion. aBIC = sample-size adjusted
Bayesian Information Criterion

Table D2

Average Latent Profile Probabilities for Most Likely Latent Profile Membership (row) by

Latent Profile (Column) for Final Model (Time 1)

	N	1	2	3	4	5	6
Profile 1	2325	**0.98**	0.01	0.00	0.00	0.01	0.01
Profile 2	538	0.00	**0.93**	0.07	0.00	0.00	0.00
Profile 3	5233	0.00	0.01	**0.98**	0.01	0.00	0.00
Profile 4	3620	0.00	0.00	0.01	**0.99**	0.00	0.01
Profile 5	977	0.01	0.00	0.00	0.00	**0.99**	0.00
Profile 6	2164	0.01	0.00	0.00	0.01	0.00	**0.98**

Table D3

Average Latent Profile Probabilities for Most Likely Latent Profile Membership (row) by

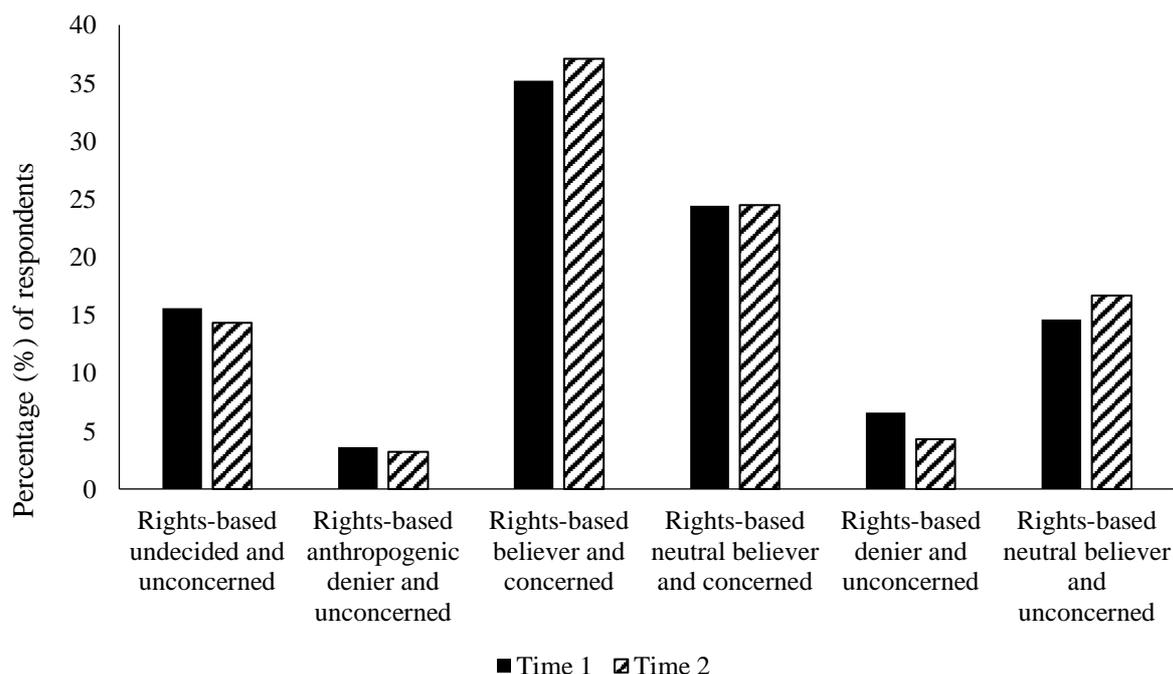*Latent Profile (Column) for Final Model (Time 2)*

	N	1	2	3	4	5	6
Profile 1	2127	**0.98**	0.00	0.00	0.00	0.00	0.01
Profile 2	471	0.00	**0.88**	0.10	0.01	0.00	0.00

Profile 3	5510	0.00	0.01	**0.99**	0.00	0.00	0.00
Profile 4	3635	0.00	0.00	0.01	**0.98**	0.00	0.01
Profile 5	632	0.01	0.00	0.00	0.00	**0.98**	0.00
Profile 6	2483	0.01	0.00	0.00	0.01	0.00	**0.98**

Figure D1

Proportion of Respondents at Each Time Period, at Time 1 (2013) and Time 2 (2014)

Table D4

Means levels of human rights and climate change item agreement constrained to equality at both time points, and proportions (%) of each profile at Time 1 and Time 2.

	Just & Reasonable Pay	Right to Food, Clothing, Housing & Medicine	Climate Change is Real	Climate Change is Caused by Humans	Climate Change Concern	Time 1 (%)	Time 2 (%)
Rights-based denier and unconcerned	6.15	5.56	1.54	2.10	1.93	6.6%	4.3%
Rights-based undecided and unconcerned	6.17	5.78	3.75	3.83	3.33	15.6%	14.3%
Rights-based anthropogenic	6.55	5.92	7.00	3.04	3.26	3.6%	3.2%

denier and unconcerned							
Rights-based believer and concerned	6.59	6.44	7.00	6.51	6.03	35.2%	37.1%
Rights-based neutral believer and unconcerned	6.04	5.77	5.00	4.62	4.01	14.6%	16.7%
Rights-based neutral believer and concerned	6.23	6.00	6.00	5.28	4.71	24.4%	24.5%