



Attitudes towards climate migrants in Aotearoa New Zealand: the roles of climate change beliefs and immigration attitudes

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Abstract

As the effects of climate change begin to materialise across Pacific Island nations, many exposed communities are considering migrating away from their homelands. Migrants' resettlement experiences can depend upon their reception in the host nation. However, it is unclear whether justice-based obligations will influence host attitudes toward climate migrants. Using an online survey of 238 Aotearoa New Zealanders, we explore how beliefs about anthropogenic climate change, climate justice and global responsibility contribute to public attitudes towards climate migrants. Overall, people thought more positively of immigrants in general than of climate migrants. Through moderated mediation analyses, we observed that people with stronger belief in anthropogenic climate change were more positive towards climate migrants. This pattern was related to people's beliefs about climate justice and justice-based migration approaches. Findings suggest that host perceptions of climate migrants are connected to being aware of the ties between greenhouse gas emissions and migration. We outline anticipated challenges and potential opportunities for both migrant communities and the nations in which they seek refuge.

Keywords Climate change · Migration · Immigration attitudes · Climate mobility · Climate justice

Introduction

The contribution of climate change to population movements is contested, despite consensus that climate change will alter mobility patterns overall (Cattaneo et al. 2019; Rigaud et al. 2018). Research suggests that most movement will be

transient and internal, but some communities are considering long-term migration across national borders (Cattaneo et al. 2019; Kelman 2015). The well-being impacts of such climate mobility depend upon the societal context at the destination (Schwerdtle et al. 2020). Host residents' responses to migrants can influence migrants' transnational connections to their homelands. Furthermore, discriminatory attitudes and behaviours towards immigrants can adversely impact their mental health (Brzoska and Fröhlich 2016; Esses et al. 2017; Priebe 2016; Schwerdtle et al. 2020). As many nations prepare for climate mobility (Remling 2020), understanding prospective hosts' views of climate migrants may be critical.

Climate migrants are themselves immigrants, for whom environmental change often co-exists alongside multiple, interconnected migration drivers (Burrows and Kinney 2016). Nevertheless, mainstream media coverage tends to ignore these complexities. Climate migrants are frequently framed as 'victims', 'refugees' or as 'vulnerable' to climate change, rather than as migrants deserving of justice (Belfer et al. 2017; Dreher and Voyer 2015; Shea et al. 2020). Many Pacific communities are resisting these narratives, preferring to tell their own stories as agents of change who choose when, where and how to migrate (Dreher and Voyer 2015; Herrmann 2017). Yet, victimisation predominates,

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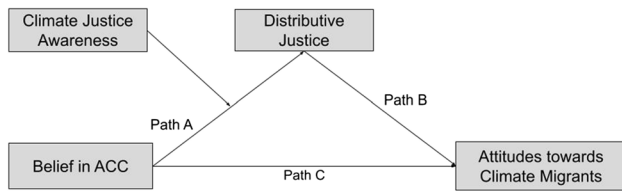


Fig. 1 Conceptual model of the direct (Path C) and indirect (Paths A–B) relationships between climate change beliefs and attitudes towards climate migrants. ACC = anthropogenic climate change. Distributive justice = support for distributive-justice based initiatives to accommodate climate migrants

ultimately dehumanising, disempowering and ‘othering’ Pacific communities in the reader’s mind (Herrmann 2017).

Using an online survey in Aotearoa¹ New Zealand (Aotearoa NZ), we first investigate how attitudes towards climate migrants compare to those towards immigrants in general (hereafter: just ‘immigrants’). We ask whether there are differences between host perceptions of climate migrants compared to immigrants (Hypothesis 1 (H1)). We then explore patterns that may underlie potential differences, asking if attitudes towards climate migrants are mediated by climate change beliefs and perspectives on climate change (H2–5).

Figure 1 conceptualises our hypotheses. As per path C, people’s belief in climate change may be related to their attitudes towards climate migrants. However, this relationship might be explained by their support for distributive justice, the belief that wealthy states should support others more affected by climate change (Pottier et al. 2017) (paths A–B). Yet, to endorse distributive justice, one must first understand both anthropogenic climate change (ACC) and its uneven distribution (climate justice awareness). Hence, people’s belief in ACC may combine with their climate justice awareness to predict their stance on distributive justice (path A), and in turn, their attitudes towards climate migrants (path B). The following sections explain these concepts further.

Attitudes towards climate migrants

Attitudes towards migrants often reflect perceptions of the cause of migration. In the case of climate mobility, the causes are multifaceted and complex. In addition, climate mobility is rarely purely voluntary, being enmeshed in destabilised economic and political systems (Kelman 2015). Public understanding of these interconnections can derive from their relationships with immigrants, histories of environmental change and the dominant climate change narratives (Echterhoff et al. 2020; Lujala et al. 2020). In Germany

(Arias and Blair 2022; Helbling 2020) and the USA (Arias and Blair 2022), residents regarded cross-border climate migrants as being forced to migrate, similar to political migrants or refugees, and more deserving of asylum than economic migrants, those who seek a better quality of life. Yet, in Kenya and Vietnam, internal climate migrants and economic migrants are seen to have equally valid reasons to migrate (Spilker et al. 2020). The authors suggest that residents in lower-income countries may see economic migration as a consequence of untenable living conditions created by climatic instabilities. Given that perceptions of cause can influence perceptions of climate migrants, we anticipate that Aotearoa New Zealanders’ (Aotearoa NZers) attitudes towards climate migrants will differ from their attitudes towards immigrants in general.

H1: There are differences in attitudes towards climate migrants compared to immigrants in general.

Such differences may also relate to whether people believe that climate change is a valid reason to migrate. Psychological research consistently relates beliefs about climate change to greater pro-environmental intentions, behaviours and climate policy support (e.g. Hornsey et al. 2016; Milfont et al. 2017). Knowledge of climate change can also inform peoples’ perceptions of threat (Van der Linden 2015). Similarly, understandings of migration drivers and consequences can influence host resident attitudes. People tend to be more positive towards involuntary migrants than voluntary migrants (Verkuyten et al. 2018), especially those migrating due to persecution, war or after experiencing extreme suffering (Bansak et al. 2016; Echterhoff et al. 2020; Kotzur et al. 2019). Hence, hosts who believe in ACC may see climate change as a more serious risk to people’s livelihoods, and therefore they could hold more positive attitudes towards climate migrants (Fig. 1, path C).

H2: Belief in ACC is related to more positive attitudes towards climate migrants.

Climate justice

Attempts to understand attitudes towards climate migrants are complexified when considering responsibility for climate mobility. Whereas political and economic migrants often move to regions that are disconnected from the cause of their misfortune (e.g. persecution or economic instability, Burrows and Kinney 2016; Koubi 2019), climate migrants tend to move towards the perpetrator—although host communities may not see themselves as such. Adopting a climate justice lens can highlight the links between displacement and host greenhouse gas emissions. Climate justice recognises that climate change impacts differ across locations and

¹ Māori name for New Zealand.

generations, and that they are more acute for groups experiencing other historically or socially constructed vulnerabilities. These impacts are often disproportionate to national greenhouse gas emissions, with many low-emitting nations bearing the burden of climate impacts (Gach 2019; Kanbur 2018).

Proponents of climate justice generally call for the fair distribution of climate burdens and benefits. They emphasise distributive justice, the allocation of material and social resources to those with less income and political influence (Kanbur 2018; Schlosberg and Collins 2014). Many climate justice advocates call for the insertion of distributive justice into migration governance. They argue that migration policies must reflect the association between industrialised nations' fossil fuel emissions and livelihood disruption in low-polluting nations. Acknowledging their complicity could then enhance their sense of responsibility to support at-risk communities (Marshall 2016; Nawrotzki 2014). Governing bodies are encouraged to provide financial support, compensation for land loss, prioritise community-led solutions and ease immigration restrictions for the environmentally threatened (Skillington 2015).

Taking together the importance of attribution (e.g. Esses et al. 2017) and distributive justice (Marshall 2016; Nawrotzki 2014), acknowledging responsibility for migration may inform people's responses to climate migrants. That is, the more host residents believe that climate change has human origins (belief in ACC), the greater their sense of responsibility for supporting climate migrants (distributive justice), and the warmer their attitudes towards climate migrants (Fig. 1, paths A and B). Hence, we hypothesise that:

H3: Greater belief in ACC is related to warmer attitudes towards climate migrants through greater support for distributive justice.

However, seeing oneself as complicit in migration may depend upon understanding that climate impacts are unevenly distributed. We refer to this knowledge as 'climate justice awareness'. According to Swim and Bloodhart (2018), knowledge of climate (in)justices may create a sense of responsibility for and a desire to minimise climate impacts. Indeed, Stanley and Williamson (2021) recently observed that supporting equality was associated with willingness to accept 'climate refugees'. Therefore, the link between believing in ACC and endorsing distributive justice may rely upon people's understandings of climate justice (Fig. 1, path A).

H4: The relationships between belief in ACC and distributive justice depend upon awareness of climate justice.

Acculturation expectations

Finally, worries about socio-cultural shifts can also influence attitudes towards migrants. Concerns about the erosion of host identities, customs or institutions—often to safeguard perceived social cohesion and societal privilege (Esses et al. 2017)—can engender hostility towards climate migrants (Brzoska and Fröhlich 2016; Burrows and Kinney 2016; Lujala et al. 2020). Host residents tend to prefer that culturally similar migrants integrate (maintain both their home and host cultures) while culturally distinct migrants are expected to assimilate (completely adopt the host culture and values) (Berry 1997; Esses et al. 2017; Florack et al. 2013). Support for integration or assimilation can relate to openness to cultural diversity (Florack et al. 2013). Hence, acculturation expectations may also be related to attitudes towards climate migrants.

H5: Assimilation and integration expectations are related to attitudes towards climate migrants.

Migration to Aotearoa New Zealand

Aotearoa NZ is likely to host future climate migrants (Cass 2018) and thus is the focus of this article. The nation's public and political discussion of climate mobility focuses almost exclusively on Pacific peoples (Cass 2018; Fuatai 2020; Ministry of Foreign Affairs and Trade [MFAT] 2018). Aotearoa NZ is relationally and politically connected with the Pacific through its location, political priorities, shared colonial histories and ancestral connections between Pacific peoples and Māori² (MFAT 2018; Te Punga Somerville 2012). Distinct Pacific communities live in Aotearoa NZ, collectively constituting 8.1% of the population (Statistics New Zealand 2018a). However, Pacific peoples have been 'othered' by the media, historically depicted as unmotivated and dependent upon Pākehā³ support ('Ofa Kolo 1990; Loto et al. 2006), and more recently, as dehumanised commodities during low wage labour shortages (Enoka 2019).

Pacific climate mobility sits within broader immigration discourse. Aotearoa NZ is ethnically diverse, with 27.4% of the population being born overseas, many from the UK, China, India and Australia (Statistics New Zealand 2019a). Most Aotearoa NZers embrace this cultural diversity, endorsing a multicultural ideology, supporting integration and appreciating immigrants' contribution to society (Spoonley 2015; Ward and Masgoret 2008). Yet, multicultural ideals

² Māori refers to the Indigenous people of Aotearoa NZ.

³ Pākehā refers to the majority group with European descent whose values and customs reflect their New Zealand location (see Spoonley and Butcher 2009).

tend to gloss over engrained racism, persistent inequalities between ethnic groups and resistance to shifts in the ‘pre-existing’ neoliberal and capitalist values of the Pākehā settler majority (Harris et al. 2018; Lyons et al. 2011).

Aotearoa NZers’ attitudes to climate migrants emerge from this context. Nearly a decade ago, Allwood (2013) reported that some Aotearoa NZers support climate mobility because of Aotearoa NZ’s Pacific connections, despite concerns that Pacific climate migrants would be a ‘welfare burden’ (p. 61) or ‘change the New Zealand [*sic*] social structure’ (p. 79). Since then, climate justice has been increasingly centred in climate policy (Gach 2019), Pacific peoples’ calls for climate justice have become more vociferous (Tahana 2019) and many Aotearoa NZers have reported supporting ‘climate refugee’ policy (Stanley and Williamson 2021). It is uncertain whether these trends translate into greater climate justice awareness, responsibility to accept climate migrants, and positive attitudes towards climate migrants overall. Moreover, it is uncertain how these factors intersect with existing perspectives on immigration.

Therefore, we seek to understand whether Aotearoa NZers’ complicity in climate mobility contributes to their attitudes towards climate migrants. Through a cross-sectional survey using an online convenience sample, we first test whether there are underlying differences in attitudes towards climate migrants, compared to other immigrants (H1). Then, summarising our hypotheses through the conceptual model (Fig. 1), we assess whether perceptions of climate migrants are mediated by climate change beliefs. In Fig. 1, path C tests the direct effect: that belief in ACC is related to attitudes towards climate migrants (H2). Paths A and B test the indirect effect: that support for distributive justice mediates the association between belief in ACC and attitudes towards climate migrants (H3). Finally, path A tests the conditional indirect effect: that awareness of climate justice moderates the relationship between belief in ACC and distributive justice (H4).

Method

Data

Data were generated through a cross-sectional online questionnaire on Aotearoa NZers’ attitudes towards climate change and migration, administered from December 2019 to March 2020. People self-selected through volunteer and snowball sampling in response to a Facebook advertisement. The advertisement was ‘seeking participants for a survey on migration and climate change’ and was incentivised by a prize draw to win one of four vouchers. The present analyses employ a subset of questions within a larger battery of measures on climate change and migration. A total of

238 people aged 18–86 years completed the questionnaire. This is considered a medium-sized sample in psychological research (Feng et al. 2020). More women (55.6%), Pākehā (87.0%) and tertiary-educated people (58.5%) were represented in this convenience sample than in the Aotearoa NZ population (see Table 1 for population-wide comparisons). Although not completely representative, a range of different participants completed the survey.

Climate change measures

The questionnaire included four climate change measures, assessed on a Likert scale ranging from 1 to 7 (1: strongly disagree; 7: strongly agree). Questions on climate change reality and belief in anthropogenic climate change, previously demonstrated to predict environmental behaviours (e.g. Hornsey et al. 2016; Milfont et al. 2017; Van der Linden et al. 2019), were derived from the New Zealand Attitudes and Values Study (NZAVS, Sibley 2018). To gauge climate justice awareness, participants responded to three questions (Cronbach’s alpha, $\alpha=0.86$) about the unequal distribution of climate impacts across generations, locations and household income, e.g. ‘My or my friends’ children will experience more extreme weather events in their lifetimes than I will’. Distributive justice, i.e. the belief that countries should support others more affected by climate change (Pottier et al. 2017), was measured from the average of three items ($\alpha=0.74$) adapted from Allwood (2013). See Online Resource I for details.

Immigration measures

We adapted perspectives on immigration from Ward and Masgoret (2008). Before answering, respondents were provided with a definition for ‘climate migrants’ but not for ‘immigrants’, as climate migrants do not frequently feature in mainstream discourse in Aotearoa NZ, unlike immigrants (Spoonley and Butcher 2009; Zaman and Das 2020). The term ‘climate migrants’ was chosen to reflect current policy discussion and avoid the more divisive term ‘climate refugees’ (Kelly 2020; Zaman and Das 2020).

We first asked all respondents about their attitudes towards immigrants ($\alpha=0.83$) then climate migrants ($\alpha=0.92$) for a within-person comparison of attitudes towards (im)migrants. The variables were assessed from three items measured on a Likert scale from 1 to 7 (1: strongly disagree; 7: strongly agree), e.g. ‘The unity of New Zealand is enhanced by immigrants’/ ‘The unity of New Zealand will be enhanced if we accommodate climate migrants’. We employed tense differences to match the framing of climate mobility in public discourse as a distant phenomenon rather than a present reality (Zaman and Das 2020).

Table 1 Descriptive statistics for the sample and the Aotearoa NZ population across survey variables

Variable	<i>n</i> (= 236)	$\hat{p}(\%)$	<i>p</i> (%)	\bar{X}	μ	<i>s</i>	α
Attitudes towards migrants (1 = more negative, 7 = more positive)							
Attitudes towards immigrants				5.10		1.48	0.83
Attitudes towards climate migrants				4.39		1.73	0.92
Assimilation expectations (1 = low, 7 = high)							
For immigrants				4.62		1.75	
For climate migrants				4.40		1.85	
Integration expectations (1 = low, 7 = high)							
For immigrants				5.35		1.37	
For climate migrants				5.07		1.46	
Climate change beliefs (1 = strong disbelief, 7 = strong belief)							
Reality				5.84		1.92	
Anthropogenic climate change (ACC)				5.11		2.34	
Climate justice awareness				4.94		1.94	0.86
Distributive justice				4.61		1.73	0.74
Demographic characteristics							
Age (median)				41	37 ²		
Household income (\$NZ)				98,700	105700 ³		
Political orientation (1 = liberal, 7 = conservative)				3.32		1.85	
Ethnicity ¹ (yes = 1; no = Pākehā)							
Māori	15	6.5	16.5				
Pākehā	202	87.0	64.1				
Pacific	5	1.7	8.1				
Asian	11	4.8	15.1				
European	23	9.5	6.0				
Not elsewhere classified	3	1.3	2.7				
Gender ^{4,5} (yes = 1; no = male)							
Male	102	42.7	46.9				
Female	131	55.6	48.2				
Non-binary or gender diverse	3	1.7	0.8				
Education ⁶							
High school	46	19.1	39.3				
Associate/technical degree/diploma	51	21.2	18.7				
Bachelor's degree	83	35.7	14.6				
Postgraduate qualification	9	3.7	5.7				
Master's degree	40	17.0	3.7				
Doctor's degree	5	2.10	0.8				
Other	2	1.20	NA				

Note. Immigration and climate change measures recorded on a Likert scale from 1 to 7

¹Defined as per Statistics New Zealand (2018a, 2019a). Frequencies do not sum to 100% as respondents could identify with more than one ethnic group

²Statistics New Zealand (2019b)

³Ministry of Business, Innovation and Employment (n.d.)

⁴Statistics New Zealand (n.d.)

⁵Statistics New Zealand (2021)

⁶Statistics New Zealand (2018b)

Acculturation expectations, including for assimilation and integration, were measured from single items adapted from Allwood (2013). Both expectations were separately measured for climate migrants and immigrants, e.g.

‘Immigrants should fully adopt New Zealand culture and values’, or ‘Climate migrants should maintain their cultures while also adopting New Zealand culture’.

Demographic and political characteristics

Socio-political and demographic characteristics demonstrated elsewhere to be associated with climate change (e.g. McCright et al. 2014; Milfont et al. 2015) and migration attitudes (e.g. Hainmueller and Hiscox 2007; O'Rourke and Sinnott 2006) were controlled for in the analyses. Covariates included age, education, household income, gender, ethnicity and political orientation. Using these covariates accounted for the variation in our measures of interest that was solely related to the demographics of the self-selected sample. To retain responses from underrepresented gender and ethnic groups, gender was assessed as male/other genders (female, non-binary, transgender and intersex) and ethnicity as Pākehā/non-Pākehā (Māori, Pacific, Asian, Middle Eastern, African and Latin American). Despite oversimplifying experiences of structural inequality, these variables broadly reflect benefitting from the male or Pākehā hegemony compared to facing historical disadvantage (e.g. Spoonley 2015; Tan et al. 2019). Political orientation was measured using one item, 'Please rate how politically liberal versus conservative you see yourself as being', measured from 1 (liberal) to 7 (conservative) (Sibley 2018).

Empirical methods

Within-subjects MANCOVA was used to test for differences in attitudes towards (im)migrants and acculturation expectations. The within-subjects MANCOVA assessed two different measurements from the same participants, rather than the same measurement at separate time points. Within-participants designs are not without their pitfalls, notably carry-over and researcher demand effects (Charness et al. 2012). However, we selected this design because people's attitudes towards immigrants are likely to inform rather than be independent of their perceptions of future climate migrants.

To test the conceptual model (Fig. 1), we employed moderated mediation analyses through Hayes (2013) PROCESS macro for SPSS (model 7). Moderated mediation analysis combines the effects of mediation and moderation to test the conditional indirect effect. This tests whether the indirect effect—the effect of the predictor (belief in ACC) on the outcome (attitudes towards climate migrants) through the mediator (distributive justice)—depends upon the level of the moderator (climate justice awareness) (Hayes 2015; Preacher et al. 2007). Statistical significance of the overall model was assessed from the index of moderated mediation, which computes the relationship between the indirect effect and the moderator. This employed 95% bootstrap confidence intervals of 5,000 bootstrap samples with homoscedasticity-consistent standard errors (Hayes 2013; 2015).

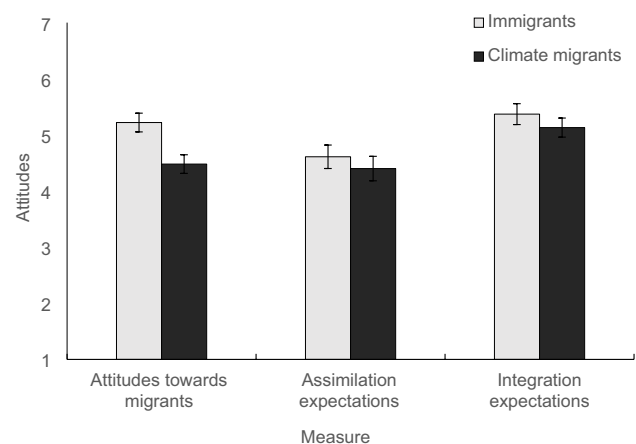


Fig. 2 Attitudes towards migrants and acculturation expectations for immigrants compared to climate migrants. Higher score indicates more positive attitudes or stronger expectations, adjusted for covariates. Covariates included age, education, income, political orientation, gender, ethnicity, and climate change reality. Error bars = 95% confidence intervals

Results

Table 1 provides descriptive statistics of demographic, climate change and immigration variables used in the analyses. First, a within-subjects MANCOVA was performed to test for baseline differences in migration attitudes, accounting only for climate change reality. These included significant differences in attitudes towards (im)migrants and acculturation expectations ($F_{\text{within effects}}(2.20, 511.42) = 47.96, p < 0.001$, Greenhouse Geisser correction, see Online Resource II). To investigate these differences further, we re-ran the analyses with all covariates to control for demographic characteristics as well as climate change reality. Most people agreed that climate migrants and immigrants in general made positive contributions to Aotearoa NZ, even when accounting for demographic differences (Fig. 2). However, attitudes towards migrants and acculturation expectations differed, supporting H1, as shown from the MANCOVA ($F_{\text{within effects}}(2.55, 512.09) = 3.70, p < 0.05$, Greenhouse Geisser correction, see Online Resource II). People felt more negatively towards climate migrants than they did towards immigrants (Fig. 2, $p < 0.01$). They expected both migrant groups to integrate more than assimilate into society ($ps < 0.01$, post hoc tests with Bonferroni correction, Fig. 2 and Online Resource II). However, climate migrants were expected to both assimilate and integrate less than were immigrants ($ps > 0.05$). Migration attitudes also varied by climate change, gender and political orientation, as Online Resource II details.

Table 2 Coefficients for moderated mediation of attitudes to climate migrants on climate change beliefs

Predictor	Path C: Direct effect on attitudes towards climate migrants		Path A: Conditional indirect effect on distributive justice		Paths B and C': Direct and indirect effect on attitudes towards climate migrants	
	Coefficient ^a	95% CI ^b	Coefficient ^a	95% CI ^b	Coefficient	95% CI ^b
Belief in ACC	0.13**	[0.03, 0.23]	0.23***	[0.10, 0.37]	0.06	[−0.04, 0.17]
Climate justice awareness	-	-	0.33***	[0.18, 0.48]	-	-
Belief in ACC*Climate Justice Awareness	-	-	0.06*	[0.01, 0.10]	-	-
Distributive justice	-	-	-	-	0.21**	[0.07, 0.03]
Integration expectation	0.37***	[0.25, 0.49]	0.23***	[0.12, 0.34]	0.32**	[0.20, 0.44]
Assimilation expectation	−0.22***	[−0.32, −0.12]	−0.08	[−0.18, 0.01]	−0.19***	[−0.29, −0.10]
Age	0.01	[−0.01, 0.02]	0.01	[0.00, 0.02]	0.004	[−0.01, 0.01]
Pākehā ^c	−0.30	[−0.672, 0.23]	0.16	[−0.24, 0.55]	−0.28	[−0.69, 0.13]
Other genders ^d	0.53**	[0.21, 0.86]	0.43**	[0.12, 0.74]	0.45**	[0.12, 0.78]
Education	0.12*	[0.01, 0.23]	−0.03	[−0.13, 0.07]	0.12*	[−0.26, −0.02]
Income	0.00	[0.00, 0.00]	0.01	[−0.09, 0.07]	−0.04	[−0.12, 0.04]
Political orientation ^e	−0.18**	[−0.30, −0.06]	−0.14*	[−0.25, −0.24]	−0.14*	[−0.26, −0.02]
Constant	2.67**	[0.34, 3.46]	3.54***	[2.41, 4.67]	2.52***	[1.24, 3.79]
R ²	0.63		0.69		0.64	
F-statistic	F(9, 211)=38.35***		F(11,201)=41.50***		F(10,202)=36.64***	
Test of unconditional interaction	-		R ² change=0.01		-	
	-		F-statistic _{interaction} (1,201)=6.41*		-	
Paths A → B: Index of moderated mediation					0.0118	[0.0002, 0.0267]

Note. ^aUnstandardised coefficients. ^bCI—Confidence interval. ^c0—non-Pākehā, 1—Pākehā. ^d0—male, 1—female, non-binary or gender diverse. ^e1—very politically liberal, 7—very politically conservative. The following values were mean-centred: belief in ACC; climate justice awareness

* $p < 0.05$ (two-tailed test)

** $p < 0.01$ (two-tailed test)

*** $p < 0.001$ (two-tailed test)

Attitudes towards climate migrants

To better understand people's responses to climate migrants, we analysed the links between their climate change beliefs and their attitudes towards climate migrants. Using moderated mediation analyses (Hayes [2013] PROCESS model 7), we first tested the conceptual model (Fig. 1) without covariates, then later included covariates for the final analysis. Excluding covariates, each path of the model was significant ($ps < 0.001$, Online Resource II) and the index of moderated mediation was greater than zero (index = 0.03 [0.01, 0.06]), suggesting that our overall model was significant.

We then re-ran the model with covariates to account for sample bias, differences in demographic characteristics and acculturation expectations (Fig. 1; Table 2). For path C (Fig. 2), belief in ACC was related to attitudes towards climate migrants ($p < 0.01$). On average, the more that people

believed in ACC, the more positively they perceived climate migrants, as per H2.

Next, we tested the indirect effect (paths A–B). For path A, belief in ACC and awareness of climate justice were positively related to support for distributive justice ($p < 0.001$). Awareness of climate justice moderated the relationship between belief in ACC and support for distributive justice, in line with H4 (interaction effect: $ps < 0.05$, Table 2 and Online Resource II). That is, the more that people believed that climate change was human caused and were aware of climate justice, the more they believed that states had differentiated responsibilities towards climate migrants. However, these relationships depended upon people's awareness of the unequal spread of climate impacts. Specifically, as people's belief in ACC increased, they were more likely to feel responsible for supporting climate migrants, especially if they were also knowledgeable about climate justice.

For path B, being more supportive of distributive justice was significantly related to having more positive attitudes towards climate migrants ($p < 0.01$, Table 2). Finally, we tested path C, accounting for the moderated mediation through paths A and B and covariates. The relationship between believing in ACC and being positive towards climate migrants was no longer significant, confirming H3 ($p > 0.05$). This signifies complete mediation, i.e. that the relationship in path C between people's belief in ACC and their attitudes towards climate migrants was explained by whether they were (a) aware of climate justice and (b) supported distributive justice-based initiatives (Table 2).

On top of this, these climate change beliefs were also related to people's political orientation, gender and acculturation expectations (as per H5). Consistently, political orientation was negatively correlated, gender was positively correlated and integration expectations were positively correlated to all outcome measures (Fig. 2 paths A to C, $ps < 0.05$; Table 2). Conversely, support for assimilation was negatively related to attitudes towards climate migrants but was unrelated to support for distributive justice (Fig. 2 paths B and C, $ps < 0.01$). To summarise, respondents who were politically liberal, supported integration and did not identify as male generally held more positive views of climate migrants. By contrast, respondents who wanted climate migrants to assimilate generally viewed them more negatively (c.f. Florack et al. 2013; Hainmueller and Hiscox 2007).

Lastly, we tested all paths of the model together. The index of moderated-moderated mediation remained (marginally) significant (index = 0.0118, [0.0002, 0.0267],⁴ Table 2), accounting for covariates. In other words, people's beliefs about climate change and about justice interacted to predict how they perceived climate migrants. Moreover, host residents' openness towards climate migrants depended upon their awareness of climate injustices, as per the conditional indirect effect (Online Resource II). For people with average-to-high awareness of climate justice, the more they believed in anthropogenic climate change, the more likely they would view climate migrants positively. By contrast, for people with little knowledge of climate justice, believing in ACC had no connection to their attitudes towards climate migrants.

These patterns are depicted in the final model (Fig. 3). Overall, people's attitudes towards climate migrants were related to their beliefs in anthropogenic climate change and their opinions about the distribution of its impacts, even when accounting for differences in sample demographics.

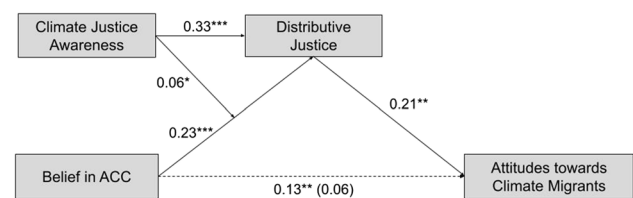


Fig. 3 Final empirical model of the direct and indirect relationships between belief in anthropogenic climate change (ACC) and attitudes towards climate migrants, including covariates. Numeric values indicate the strength of the associations between variables. Solid lines indicate significant relationships; dotted lines indicate the non-significant relationship when accounting for the mediation through distributive justice

Consistently, people who were the most positive towards climate migrants believed that climate change was human caused and were also aware that its impacts are unjustly distributed. This pattern was observed on top of the relationships between climate change beliefs, acculturation expectations and demographic characteristics (Table 2).

Attitudes towards immigrants

For comparison, we assessed whether climate change beliefs were also related to attitudes towards immigrants. We reran the moderated mediation analysis for attitudes towards immigrants (Online Resource II). Climate change beliefs were not tied to attitudes towards immigrants in general (the direct effect [Fig. 1 path C], $p > 0.05$), so we did not test the model further. However, acculturation attitudes and political orientation were linked to attitudes towards immigrants ($ps < 0.01$). People who were more politically liberal, had higher integration expectations and had lower assimilation expectations viewed immigrants more positively.

Discussion and conclusion

Overall, respondents from this cross-sectional, opt-in study were positive towards immigrants in general and climate migrants specifically, including when accounting for differences in sample demographics. This positivity reflects previous findings about Aotearoa NZers' openness to cultural diversity (Perry et al. 2018; Sibley and Ward 2013). However, people believed that immigrants more than climate migrants made positive contributions to society, even accounting for sample characteristics and different levels of belief in climate change (cf. Ipsos 2016; Ward and Masgoret 2008). We propose that these differences in immigration attitudes are related to climate change beliefs and the effect of being complicit in climate migration.

Firstly, the difference in attitudes between immigrants and future climate migrants may reflect the uncertainties

⁴ The effect size is significant, though small. The Bootstrap confidence interval is positive, albeit small. Four decimal places are used here to show this effect.

surrounding climate mobility. There were no official climate migrants in Aotearoa at the time of data collection, reflected in the survey questions which compare attitudes towards ‘future’ climate migrants with attitudes towards contemporary immigrants. Despite creating additional uncertainty, these different temporal framings assessed the abstract (Dreher and Voyer 2015) and imprecise (Hoffman et al. 2021) status of climate mobility discourse in Aotearoa NZ. In the absence of concrete information about the nature of climate mobility (Zaman and Das 2020), respondents may have substituted the uncertainties surrounding the future of climate mobility with negative stereotypes evoked by mainstream media (Echterhoff et al. 2020; Swim and Bloodhart 2018), such as Pacific peoples being financially ‘dependent’ (Allwood 2013; Loto et al. 2006). While we accounted for climate change scepticism in our analysis, we did not directly test for such economic concerns (c.f. Stanley and Williamson 2021).

Our model suggests that climate change beliefs contribute to these attitudinal differences. Individual variation in belief in ACC was related to warmth towards climate migrants through support for distributive justice. Being a cross-sectional study, our findings do not support causality nor the direction of the association. Namely, believing in ACC could be driving attitudes towards climate migrants, or attitudes towards climate migrants could be influencing belief in ACC. Nonetheless, our model does support claims that how one perceives the cause of mobility is tied to how one regards climate migrants (Echterhoff et al. 2020; Hornsey et al. 2016). That is, acknowledging climate change as real may encourage hosts to see climate change as a form of involuntary displacement, thus, to view climate migrants as deserving of assistance (cf. Verkuyten et al. 2018). Furthermore, the mediation through distributive justice (Fig. 3, paths A and B) supports Nawrotzki (2014) in that responsibility for climate migrants may emerge when one observes the interconnectedness of human activities and climate-related livelihood destruction. Combining Nawrotzki’s and others’ work (e.g. Helbling 2020; Stanley and Williamson 2021) with our observations, we propose that acknowledging one’s complicity in climate mobility fosters positivity towards climate migrants. Conversely, refuting human contributions to climate change may lead to denying Aotearoa NZ’s duty of care (cf. Esses et al. 2017; Verkuyten et al. 2018; Swim and Bloodhart 2018). However, further research with an experimental design is needed to confirm this effect of complicity.

Awareness of climate justice was also conditionally related to support for distributive justice. This suggests that understanding the diverse impacts of climate change on people’s lives may foster a sense of responsibility towards climate migrants (cf. Lujala et al. 2020). For example, people who connect climate change in the Pacific to livelihood

disruption may be more likely to regard economic migration as a form of climate migration (cf. Spilker et al. 2020; Verkuyten et al. 2018). Consequently, they might believe that major-emitting states have a responsibility to welcome *all* migrants from nations with an elevated risk of environmental degradation. However, there is much ambiguity surrounding migration drivers, given the routine omission of the historical and structural causes of climate ‘vulnerability’ in the Pacific (Dreher and Voyer 2015; Shea et al. 2020). Hosts may be unaware of justice-based arguments for accepting climate migrants (c.f. Swim and Bloodhart 2018). Indeed, the observed differences in attitudes towards other immigrants compared to climate migrants (c.f. Arias and Blair 2022; Helbling 2020; Spilker et al. 2020) may reflect this lack of understanding. Going forward, it is important to understand whether host residents in different regions associate economic migration with climate change, and how personal immigration experiences, access to resources and climate justice beliefs inform their opinions.

Acculturation expectations were related to attitudes towards climate migrants, independent of climate change beliefs. Most respondents were open to climate migrants and supported their integration (cf. Ward and Masgoret 2008), although many people also endorsed assimilation. As assimilation implies a cultural loss, pressure to conform to hosts’ expectations may disrupt migrants’ cultural, linguistic, identity and spiritual ties to their homes (Allwood 2013; Choy, Ward and Masgoret 2008). Conversely, migrants’ efforts to maintain their cultures and languages (i.e. integrate) may be met with hostility in regions where the hosts prefer assimilation—especially those where the residents are unfamiliar with climate migrants’ (Pacific) cultures (c.f. Esses et al. 2017; Lujala et al. 2020). Nonetheless, our model suggests that educating the public about climate justice has the potential to counter hostility and socio-cultural concerns. Without having tested this experimentally, it is plausible that encouraging residents to connect local fossil fuel use with offshore environmental and economic insecurity could increase positivity towards climate migrants overall.

However, it is important to note that participants were first asked about immigrants and then about climate migrants, who are also immigrants. Complete independence of paired samples is not necessary for repeated-measures analysis (Nimon 2012) but this pairing may have created a degree of overlap in responses. Furthermore, question order can bias outcomes in within-participants survey designs. Attitudes towards climate migrants may have differed had the question order been reversed or excluded prior reference to immigrants (Charness et al. 2012). Although within-person comparison was our intention, such biases may have reduced the strength of our overall model, which was statistically significant, despite the small effect size (Table 2). Furthermore, our findings rely upon a convenience sample, notably

including proportionally more women, Aotearoa NZers of European descent (Pākehā) and tertiary-educated people than in the general Aotearoa NZ population. Extending our study to a larger, more representative sample that controls for established relationships between economic concerns and immigration attitudes (e.g. Stanley and Williamson 2021) may strengthen the observed effect of complicity.

Overall, we have demonstrated a persistent link between climate change beliefs and attitudes towards migrants which is not attributable to sample demographics and is unique to our regional context. In Aotearoa NZ, recognising that host nations are complicit in climate mobility may foster responsibility to accept future climate migrants, and increase the chances that host communities will welcome them warmly. Nonetheless, complex interactions between residents' climate change beliefs emphasise that no singular response to mobility can be assumed across and within receiving countries

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Declarations

Ethics approval and consent to participate Ethical approval was obtained from the University of Auckland Human Participants Ethics Committee Ref. 024001. Participation in the survey was with informed consent.

Conflict of interest The authors declare no competing interests.

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