The Impact of Economic And National Identity Loss Messages, And The Moderating Effect of Political Orientation, On Climate Change Policy Support

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Abstract

As climate change continues to be politically divisive, developing communications that align with right-leaning beliefs may increase bipartisan support for climate policy. In two experimental studies (Study 1, Australia, $N = 558$; Study 2, United States, $N = 859$), we tested whether an economic loss or national identity loss message would elicit greater support for mitigation and adaptation policies when compared to one another and to a control message. We also tested whether the direct effects of these message types were conditional on political orientation (specifically, identifying as politically right-leaning). In both studies, preliminary analyses indicated that the message manipulations were effective and that there was a high level of support for both types of climate policy. When compared to left-wing adherents, those who were politically right-leaning were less likely to support mitigation and adaptation policies in either sample. Australian (Study 1) identification – although not American identity (Study 2) – also uniquely predicted adaptation support (but not mitigation support). Yet, there were no significant message frame or interaction effects in the Australian (Study 1) or U.S. sample (Study 2). This suggests that neither an economic loss nor national identity loss message frame may be effective in overcoming the political polarization of climate change in Australia or the United States. Nevertheless, national identity could still play a useful role in Australian climate communications given its positive relationship to adaptation policy support, and therefore warrants further investigation.

Keywords: Mitigation policy; Adaptation policy; Climate change communication;
Economic Loss; National Identity Loss; Political Orientation

The Impact of Economic Loss and National Identity Loss Messages, and the Moderating Effect
of Political Orientation, on Climate Change Policy Support

Anthropogenic climate change requires urgent and effective governmental policy to be implemented (Clayton et al., 2015). One class of needed policies are mitigation-based, wherein the focus is on limiting the severity of climate change through reducing carbon emissions (herein referred to as *mitigation policy*) (Bateman & O'Connor, 2016). There is also a need for policies that work to adapt to the inevitable effects of climate change, primarily via infrastructure or technology (herein referred to as *adaptation policy*) (Bateman & O'Connor). One strategy to help increase the likelihood of the implementation of these climate policies is to increase the chances of bilateral co-operation and agreement between right- and left-leaning political parties and, by extension, their supporters (Fielding et al., 2020).

Past research has focused on developing informational interventions to increase climate change policy support (Steg & Vlek, 2009; Nisbet, 2009). However, climate change continues to be politically polarized in nations such as Australia and the United States (Hornsey, Harris, & Fielding, 2018; Smith & Mayer, 2019). Right right-wing adherents are less likely to support climate change policy – especially mitigation policy – when compared to their left-wing counterparts in these nations (Dunlap, McCright & Yarosh, 2016; Fielding, Head, Laffan, Western & Hoegh-Guldberg, 2012; Hart & Nisbet, 2012). This politicization of climate change contributes to the effectiveness of climate change communication in Australia and the United States, and therefore future climate action, as individuals often fail to respond well to climate messages that are misaligned with their underlying political beliefs and valued identities (Wolsko, Ariceaga & Seiden, 2016).

Given these considerations, there is a need to identify message frames that are effective in increasing support for climate policy, especially in those who are politically right-leaning in Australia and the United States (Klas & Clarke, 2020). As right-wing adherents appear to be sensitive to loss and threat (Feygina, Jost, & Goldsmith, 2010; Jost, Glaser, Kruglanski, & Sulloway, 2003), one approach is to develop messages that are loss-oriented and align with their political beliefs and values, such as a preference for economic stability and nationalism. As such, we suggest that there is a need investigate the effectiveness of economic and national identity loss messages on increasing climate policy support in right-wing adherents. Using both Australian (Study 1) and US (Study 2) samples, we investigated whether an economic loss frame that highlighted the potential for climate change to threaten economic stability (by describing how climate change will result in a loss of economic prosperity), or a national identity loss frame that threatened national identity (by describing beloved national environmental locations that are threatened by climate change), could increase support for mitigation and adaptation policies when compared to a control message. We also investigated whether the effects of these messages were conditional on political orientation (specifically, identifying as politically right-leaning).

Political Orientation and Climate Change Communication

Political orientation often predicts climate change outcomes, especially in Anglosphere nations (Hornsey et al., 2018; Smith & Mayer, 2019). In Australia and the United States specifically those who are politically right-leaning (or socially/economically conservative) are less likely to believe climate change is happening or is anthropogenic and are less likely to engage in climate action when compared to their politically left-leaning (or socially/economically liberal) counterparts (Dunlap et al., 2016; Leviston & Walker, 2012). Likewise, right-wing adherents are also less likely support climate change policies, especially

mitigation policies which are focused on limiting the severity of climate change through reducing carbon emissions (e.g., emissions trading schemes or a carbon tax) (Unsworth & Fielding, 2014).

These differences between politically right- and left-leaning individuals when it comes to climate change appear to partially arise due to their underlying political beliefs (Fielding et al., 2020). While right-wing adherents tend to value tradition, nationalism, stability and free-market economic growth, their left-wing counterparts tend to value benevolence, equal opportunity, and environmental protection (Koleva, Graham, Iyver, Ditto, & Haidt, 2012; Osborne, Milojev & Sibley, 2017). Further still, even though right-wing and left-wing adherents have similar physiological responses to threat, it is likely that each group is more loss-averse when encountering situations which threaten what their group specifically values (Bakker et al., 2020). For instance, right-wing adherents are sensitive to threats to free-market economic growth or nationalism (an economic and cultural value respectively). Consequently, right-wing adherents are often motivated to maintain current national social norms, preserve the status quo, and/or minimize social or economic change (Feygina, Jost, & Goldsmith, 2010; Jost, Glaser, Kruglanski, & Sulloway, 2003).

Unsurprisingly then, right-wing adherents appear to be less likely to accept climate change policies if they perceive them to be a threat to the socio-economic status quo, especially if these policies proactively change the current system (Clarke, Ling, Kothe, Klas, & Richardson, 2019). This also suggests that right-wing adherents are less likely to support climate change policy as they are motivated to reduce as much potential ‘loss’ as possible, especially when this loss is tied to things which they value economically (e.g., economic stability) or culturally (e.g., nationalism). Yet, one way to reduce this politically polarized response to climate change is to

develop ‘message frames’ that lessen the intensity of these ideological barriers (Klas & Clarke, 2020).

Message framing typically involves organizing information to emphasize a specific aspect of the issue, without changing the message’s overarching viewpoints. One important type of framing in climate change emphasizes gains (rewards) or losses (threats) of taking climate change action (Nisbet, 2009). Climate change gain messages typically present a potential positive outcome that may arise from a proposed action for climate change (e.g., “doing something about climate change will improve health outcomes”), while climate change loss messages usually present the negative outcomes that will arise from failing to act (e.g., “doing nothing about climate change will lead to worse public health outcomes”). Most message frames have produced mixed findings for those who are politically-right leaning (Chinn & Hart, 2021; Severson & Coleman, 2015; Singh & Swanson, 2017; Wolsko, et al., 2016). However, framing messages to align with right-leaning individuals’ political beliefs, and thus ensuring they also emphasize the losses that climate change will result in, could be an effective strategy to build bipartisan support for climate change policies. This could especially be the case if the potential losses noted in the message threaten things which right-wing adherents’ either economically or culturally value, such as economic stability and nationalism.

Aligning with Conservative Economic and Cultural Values: The Potential of Economic and National Identity Loss Message Frames

Currently, most climate change message frames are either gain focused and/or emphasize content which politically right-leaning individuals’ value less (Hart & Nisbet, 2012; Singh & Swanson, 2017). For instance, environmental preservation messages are often framed in ideological and moral terms which are more appealing to left-wing adherents as they emphasize

ecological diversity and community resilience (Bain et al., 2016). Even when message content aligns with right-wing adherents' values, such as their preference for economic stability and free-market opportunities, these economic messages are usually growth or 'gain' oriented (Hennes, Ruisch, Feygina, Monteiro & Jost, 2016). Yet, emerging research suggests that economic growth messages may be outperformed by economic loss messages, which instead specify the destabilizing global economic impact of environmental disasters (Bertolotti & Catellani, 2021; Severson & Coleman, 2015). For instance, seeing messages which promoted climate policy through stressing the negative consequences of not implementing said policies (rather than its positive consequences of implementation) appeared to increase agreement with subsequent economic loss messages (vs gain messages) (Bertolotti & Catellani, 2021). Further still, while examining climate believers specifically, recent studies in the U.S. and Italy have demonstrated that messages which outlined the potential economic losses of adopting certain policies were more effective in increasing climate policy support when compared to economic gain messages (Bertolotti et al., 2021).

Beyond the potential usefulness of an economic loss frame, an alternative and underexplored frame that may also prove fruitful in this context is that of national identity loss. That is, highlighting how climate change may result in losing environmental icons which are valued by an individual's nation and therefore important to a nation's identity. Many Anglosphere nations, such as Australia, view specific environmental icons like national parks and beaches as crucial to their national identity and therefore something that should be protected for the good of the country (Bonaiuto, Breakwell, & Cano, 1996; Purdie & Wilss, 2007). Nationalistic attitudes are often also positively correlated with right-wing identification (Osborne et al., 2017), while right-affiliated attitudes positively correlate with one's sense of national

identification, including right-wing authoritarianism (RWA) and social dominance orientation (SDO) (as seen in the United States; Roccas et al., 2010). This loyalty and gratitude to one's country is often expressed by promoting the interests of one's nation over and above the interests of those external to it. It even appears to occur in environmental contexts with those who are politically right-leaning more likely to be motivated to protect the environment if it means that it will also protect national interests (Sapiains, Beeton, & Walker, 2016; McCright & Dunlap, 2014).

As well as aligning with conservative values, a national identity loss frame taps into conservatives' higher sensitivity to loss when something they value culturally is under threat (Feygina et al., 2010; Jost et al., 2003). For instance, in one study, Feygina et al. (2010) investigated a national identity loss frame with a U.S. sample and found that by presenting pro-environmental messages as patriotic and environmental conservation as key to protecting and preserving the "American way of life", it was possible to increase conservatives support for general pro-environmental behaviours, such as recycling. Similarly, Wolsko et al. (2016) demonstrated right-wing adherents in the U.S. are more likely to support climate change action when exposed to a frame that outlined how protecting the natural environment is a matter of obeying authority, defending the purity of nature, and patriotism (all conservative values). Finally, research with Australians who rejected anthropogenic climate change showed that they were more likely to support climate change policies after receiving a national identity gain message when compared to biodiversity or economic gain messages (Sapiains et al., 2016). While none of these findings examined a national identity loss frame, its comparison to economic loss message specifically, and whether its effectiveness was conditional on political

orientation, they do point to the potential usefulness of developing message frames that target conservative values of economic stability and nationalism for right-wing adherents.

The Present Research

The aims of this research were to investigate whether an economic loss or national identity loss message increased climate change policy support when compared to one another and to a control message, and whether their potential effectiveness was conditional on political orientation (specifically, right-wing political orientation). We conducted two online experimental studies to test these aims: the first in Australia (Study 1) and the second in the United States (Study 2). Australia presents a ripe area to test these potential effects as the topic of climate change continues to be politically polarizing and the country itself rates as one of the lowest performing Western nations on climate policy (Sachs et al., 2021). Furthermore, Australia relies heavily on fossil fuel exports for its Gross Domestic Product (GDP) (Department of the Environment and Energy, 2018), even though Australians view their natural environment as a core component of their national identity (Purdie & Wilss, 2007). This suggests Australians could be especially sensitive to economic and national identity loss messages. Further still, the United States has also experienced significant political polarization (Finkel et al., 2020), especially regarding climate change (Dunlap et al., 2016). Therefore, a United States sample also provides the opportunity to potentially replicate and extend upon any potential effects found in Australia.

In both studies, we employed a between-subjects experimental research design, with one factor (message type) that had three levels (economic loss, national identity loss, control). Participants were randomly assigned to one of these three message conditions (i.e., levels). As one of our message types threatened national identity (i.e., national identity loss message), we

also measured and controlled for the potentially confounding impact of national identity in both studies.

Study 1: The Australian Context

The first study examined the aims outlined above in an Australian sample. We hypothesized that there would be a direct, negative effect of right-wing political orientation on climate change policy support (mitigation, adaptation) (H1). When controlling for Australian identity, those who were politically right-leaning would report lower rates of policy support. We also hypothesized that there would be an interaction effect of message type, in that the message participants received would interact with their political orientation to further contribute to their level of climate change policy support (mitigation, adaptation) (H2). Specifically, when controlling for Australian identity, higher rates of climate policy support would be observed in right-leaning individuals receiving the national identity loss message or economic loss message relative to those who received a control message.

Method

Participants and Procedure. A total of 684 Australian citizens/residents were originally recruited via the Australian market research firm PureProfile. Participants who did not complete the full questionnaire ($n = 5$) or who failed at least one of the two attention checks ($n = 121$) were removed, leaving a final sample of 558. Participants were aged between 18 and 86 ($M_{age} = 47.12$, $SD_{age} = 16.96$; male = 307 (55.32%), female = 247 (44.50%), non-binary = 1 (.18%), missing = 3)). Other demographics are in the supplementary materials.

The market research company PureProfile advertised the study to their participant pool in July 2018¹, actively targeting those who had indicated previously to them that they either self-identified as politically left-leaning ($n = 276$) or politically right-leaning ($n = 282$). To reduce demand characteristics, participants were told that the study assessed their understanding of science communication, with no reference made to climate change in recruitment materials. After reading the plain language statement and providing consent, all participants completed the pre-message measures and then were randomly allocated to receive one of the three messages using the automatic randomisation feature in Qualtrics. Participants then completed the post-message measures. The study was 10 minutes and participants were paid \$AUD5.30 in compensation.

Pre-Message Measures.

Participants' age, gender, education, income, and state of residence was collected. Participants' strength of Australian identity was measured using a single item ('I identify with Australians', 1 = strongly disagree, = 7 strongly agree) (Postmes, Haslam, & Jans, 2013). A single-item measure of political orientation was also employed ('In politics people sometimes talk of the left-wing and right-wing. Where would you place yourself? 1 = very left-wing, 7 =

¹ Data collection was completed before the change in Prime Ministership in August 2018, which occurred due to ongoing internal party disagreement in the Liberal/National Coalition regarding climate change and renewable energy policy.

very right-wing)^{2, 3}. The higher one scored on this item, the more they identified as politically right-leaning.

Message Frames.

Each message was a fictitious online newspaper article which detailed a new report released by leading university scientists. The first message outlined that the national economy would be threatened if effective climate policy was not implemented (*economic loss message*). The second message outlined how Australia's natural icons would be jeopardized or lost, and therefore Australia's unique cultural identity and way of life, would be under threat if effective climate change policy was not implemented (*national identity loss message*). The third message served as a control condition and described how antibiotic resistance was predicted to threaten Australia's health outcomes (*control message*). See supplementary materials for a copy of the message types.

Post-Message Measures.

Attention and Manipulation Checks

Using two items, we checked that participants read and understood their randomly allocated message (Attention check 1: What issue did the newspaper article discuss?; Attention check 2 = What negative impacts did the newspaper article discuss?). Participants who failed at

² Left-wing and right-wing were used as anchor points on the scale in Study 1 rather than the typical liberal and conservative anchor points seen in the research literature. This is because within the Australian context the major conservative party is called the Liberal Party, and as such it may have confused Australian participants who are not clear on the distinction between party labelling and ideological labelling.

³ We also assessed political beliefs with two additional measures of right-wing ideological beliefs for purposes outside the scope of this study. These included Social Dominance Orientation (SDO7) (Ho et al., 2015) and Right-Wing Authoritarianism (Dunwoody & Funke, 2016). However, we ran the same analyses with SDO and RWA replacing the single-item measure of political orientation with either SDO or RWA to see whether the findings held. We found the same results reported in this manuscript. Therefore, for the sake of clarity, the descriptives of SDO and RWA and associated analyses are instead reported in the supplementary materials.

least one of these two attention checks were excluded from final analyses ($n = 121$) (see supplementary materials for more details). We also asked participants to indicate the likelihood that climate change would impact the outcome outlined in their allocated message to ensure the manipulations were successful ('How likely is that climate will influence economic prosperity /Australian identity/ /antibiotic effectiveness?') (1 = Not at all, 7 = A great deal). Analyses indicated that the manipulations were effective (see supplementary materials for details and results of these analyses).

Climate Change Policy Support

Bateman and O'Connor's (2016) two-factor climate change policy support scale measured participants support for mitigation policies (e.g., "implementing a "carbon tax" on coal and other fossil fuels to reduce their use", 6-items) and adaptation policies (e.g., "Setting aside land corridors to help species migrate", 5-items) (1 = strongly disagree, 7 = strongly agree).

Results

We used R (Version 4.0.2; R Core Team, 2020) and the R-packages apaTables (Version 2.0.5; Stanley, 2018), psych (Version 2.0.12; Revelle, 2018), tableone (Version 0.9.3; Yoshida & Bohn., 2018), and interactions (Version, 1.1.3; Long, 2020) for our all analyses.

Descriptives.

Table 1 presents the descriptives for the major continuous variables in Study 1. The sample overall largely identified as Australian and demonstrated moderate to high support for both mitigation and adaptation policy. There was a small, positive correlation between Australian identity and political orientation, suggesting that identifying as an Australian was weakly related to whether one was politically right-leaning. Australian identity had no relationship with mitigation policy support, and a small, positive relationship with adaptation policy support.

Right-wing political orientation was negatively related to both mitigation and adaptation policy support, and moderately so in the case of mitigation policy.

Table 1

Means, Standard Deviations, Correlations, and Reliability Estimates for Study 1

Variables	<i>M</i>	<i>SD</i>	α	ω	1	2	3
1. Australian Identity	5.24	1.32					
2. Political Orientation	3.96	1.64			.10*		
					[.02, .18]		
3. Mitigation Policy Support	5.63	1.12	.88	.93	.01	-.37**	
					[-.07, .10]	[-.44, -.29]	
4. Adaptation Policy Support	5.45	1.05	.84	.86	.12**	-.19**	.67**
					[.03, .20]	[-.27, -.11]	[.61, .71]

Note. $N = 558$. M = Mean. SD = Standard Deviation. α = Cronbach alpha. ω = McDonald's Omega. Values in square brackets indicate the 95% confidence interval for each correlation. All scales measured on a 1 to 7 scale.

* $p < .05$. ** $p < .01$.

Despite initial data collection resulting in even participant numbers across the three message frame conditions ($N = 684$, economic loss $n = 224$, national identity loss $n = 229$, control $n = 231$), removal of participants who failed attention checks resulted in uneven participant numbers in the three message frame groups ($N = 558$, economic loss $n = 191$, national identity loss $n = 167$, control $n = 200$). Therefore, we also conducted two one-way ANOVAs to

check whether there were any meaningful participant differences on Australian identity and political orientation according to which condition participants were randomly allocated to.

For Australian identity, there was no significant difference between participants who randomly received an economic loss message ($M = 5.29$, $SD = 1.21$), a national identity loss message ($M = 5.32$, $SD = 1.42$), or a control message ($M = 5.12$, $SD = 1.33$), $F(2, 555) = 1.22$, $p = .295$, $\text{partial } \eta^2 = .00$. There was also no significant difference between participants who received an economic loss message ($M = 3.89$, $SD = 1.66$), a national identity loss message ($M = 4.01$, $SD = 1.66$), or a control message ($M = 4.00$, $SD = 1.61$) on their level of political orientation, $F(2, 555) = .28$, $p = .753$, $\text{partial } \eta^2 = .00$. Therefore, it appeared message randomisation was still successful despite participant numbers differing slightly per condition post data cleaning.

Direct and Interactive Effects on Climate Change Policy Support in Australia.

Two moderated multiple regressions were conducted, one for each dependent variable. We first started by creating two planned orthogonal contrasts to compare the effect the messages had on the dependent variables. Firstly, to compare the intervention messages to the control message, we created planned contrast 1, coding: .5 = economic loss message, .5 = national identity message, -1 = control message. Then, to compare the intervention messages to one another (while simultaneously controlling for the control message), we created planned contrast 2: -1 = economic loss message, 1 = national identity loss message, 0 = control. To examine the unique effect of the message frames, planned contrasts were entered in at Step 1. In Step 2, we entered the covariates of Australian identity and political orientation. Finally, in Step 3, the two-way interactions between political orientation and message type (i.e., contrast 1, contrast 2) were included. A sensitivity power analysis conducted post data collection suggested

that with a sample of 558, the final sample size would deliver 80% power to detect an r-square of .025 or greater, with six predictors, at an alpha of .05.

For the outcome variable of mitigation policy support (Table 2), there was no significant effect of message type on mitigation policy support. However, a significant negative effect of political orientation emerged, providing support for H1. When controlling for Australian identity, Australians who were politically right-leaning were less likely to support policies that aim to limit the magnitude or rate of long-term climate change (e.g., emissions trading scheme, carbon tax). However, there was no direct effect of Australian identity. We also obtained no support for H2; there was no statistically significant political orientation x message type interactions observed on mitigation policy support.

For the outcome variable of adaptation policy support (Table 3), there was no significant effect of message type on adaptation policy support, once again suggesting that the message frames did not influence the outcome variable. A significant negative effect of political orientation emerged, providing further support for H1. Australians who were politically right-leaning were less likely to support policies intended to cope with the inevitable effects of climate change, when also controlling for Australian identity. Unexpectedly, we found a significant unique positive effect of Australian identity, in that those who identified more strongly as an Australian were more likely to support adaptation policies. H2 was also not supported as we did not observe any significant political orientation x message type interactions on adaptation policy support.

Table 2

Hierarchical Moderated Multiple Regression of Mitigation Policy Support for Study 1

	β	β 95% CI	sr^2	sr^2 95% CI	R^2	ΔR^2
Step 1					.004 [.00, .02]	
Message (interventions vs control)	.08	[-.03, .20]	.00	[-.01, .01]		
Message (national identity vs economic)	.03	[-.08, .13]	.00	[-.00, .00]		
Step 2					.142** [.09, .19]	.138** [.08, .19]
Australian Identity	.05	[-.03, .13]	.00	[-.01, .01]		
Political Orientation	-.37**	[-.45, -.30]	.14	[.08, .19]		
Step 3					.145** [.09, .19]	.003 [.00, .01]
Political Orientation x Message (interventions vs control)	.07	[-.04, .18]	.00	[-.01, .01]		
Political Orientation x Message (national identity vs economic)	-.03	[-.12, .07]	.00	[-.00, .00]		

Note. $N = 558$. β = standardized regression weights. sr^2 = semi-partial correlation squared. R^2 = coefficient of determination. ΔR^2 = change in R^2 . 95% CI = 95% confidence interval.

Square brackets enclose the lower and upper limits of a 95% confidence interval.

** $p < .01$.

Table 3

Hierarchical Moderated Multiple Regression of Adaptation Policy Support for Study 1

	β	β 95% CI	sr^2	sr^2 95% CI	R^2	ΔR^2
Step 1					.001 [.00, .01]	
Message (interventions vs control)	.05	[-.06, .17]	.00	[-.00, .01]		
Message (national identity vs economic)	.00	[-.10, .11]	.00	[-.00, .00]		
Step 2					.055** [.02, .09]	.053** [.02, .09]
Australian Identity	.14**	[.05, .22]	.02	[-.00, .04]		
Political Orientation	-.20**	[-.28, -.12]	.04	[.01, .07]		
Step 3					.055** [.02, .09]	.001 [-.00, .00]
Political Orientation x Message (interventions vs control)	.03	[-.08, .15]	.00	[-.00, .00]		
Political Orientation x Message (national identity vs economic)	.01	[-.09, .11]	.00	[-.00, .00]		

Note. $N = 558$. β = standardized regression weights. sr^2 = semi-partial correlation squared. R^2 = coefficient of determination. ΔR^2 = change in R^2 . 95% CI = 95% confidence interval.

Square brackets enclose the lower and upper limits of a 95% confidence interval.

** $p < .01$.

Discussion

Using an Australian sample, Study 1 investigated whether there was a relationship between climate change loss messages (i.e., economic and national identity loss) and policy support, and whether this relationship was moderated by right-wing political orientation. We also measured Australian identity to control for its potential impact on the major variables of the study. As hypothesized, political orientation negatively predicted climate policy support, with those who were politically-right leaning less likely to support mitigation and adaptation policies. Consistent with emerging research, mitigation policies appeared to be more politically divisive in the Australian context (Bateman & O'Connor, 2016; Tranter & Lester, 2017), with the negative effect of political orientation stronger in the context of mitigation policies than adaptation policies.

Identifying as Australian was weakly related to political orientation, yet it did predict support for adaptation policy (but not mitigation policy) when controlling for message type and political orientation. Therefore, it appears that national identity may have different implications in the Australian context, such as not being tied strongly to being right-wing as is the case in the United States (Osborne et al., 2017; Roccas et al., 2010). Furthermore, the association between Australian national identity and support for adaptation policy (but not mitigation policy) may be partially explained by how Australians typically view environmental icons as crucial to their national identity (Bonaiuto, Breakwell, & Cano, 1996; Purdie & Wilss, 2007). While mitigation policies are focused on reducing the severity of carbon emissions, adaptation policies are typically oriented towards protecting and preserving natural environments via technological advancements, and this could include some of these environmental icons in Australia (e.g., protecting coastal areas like the Great Barrier Reef, protecting against bushfires in iconic areas).

Nevertheless, neither the economic loss nor national identity loss messages influenced policy support, and the effectiveness of these messages was not conditional on political orientation. Therefore, presenting Australians with messages which emphasize the potential threats to the economy or the potential loss of Australia's environmental icons, relative to a control condition, did not increase climate policy support. This was the case even for adaptation policies and for participants who were more politically right-leaning.

Overall, the mean of Australian identity was high, suggesting most participants largely identified as Australian. As we actively targeted those who had indicated previously that they either self-identified as politically left-leaning ($n = 276$) or politically right-leaning ($n = 282$), our sample also did not skew towards one end of the political spectrum. Furthermore, mitigation and adaptation policy support were reasonably high across all conditions. This suggests that there may have been a potential ceiling effect, in that we did not observe any meaningful differences between groups according to message type because participants on average supported mitigation and adaptation strategies. It is also possible that our sample contained individuals who were skeptical or denied climate change, as these participants were not screened out prior to receiving one of the messages. As noted above, prior research has demonstrated that those who are politically right-leaning in Australia and the United States are more likely to deny the existence of climate change (Clarke et al., 2019; Hornsey et al. 2018), with this political polarization especially strong in the United States (Finkel et al., 2020). Therefore, it can be argued that those who deny climate change and its impacts simply do not think it is an issue worth acting upon and are therefore less likely to attend to and process information which suggests climate policy should be enacted. This may partially explain why although participants understood the content of the national identity and economic loss messages (that is, the manipulations were successful),

the messages did not contribute to climate change policy support. Thus, in Study 2, we sought to recruit a United States sample where participants believed climate change was real and that it was happening, testing the same message types and potential interactions in this specific sample.

Study 2: The United States

In Study 2, we sought to test the same aims from Study 1, but this time in a sample from the United States who believed climate change is human-induced and occurring. We had the same hypotheses for Study 2 as those in Study 1, except this time we controlled for American identification.

Method

Participants and Procedure. A total of 1,060 American citizens and/or residents were recruited via Amazon Mechanical Turk (MTurk) using TurkPrime. Participants who did not complete the full questionnaire ($n = 44$), who failed at least one of the attention checks ($n = 77$), and who did not believe in climate change ($n = 83$) were excluded. This resulted in a final sample of 859, with participants aged between 18 and 78 ($M_{age} = 40.00$, $SD_{age} = 12.25$; male = 395 (45.99%), female = 456 (53.08%), non-binary = 7 (.81%), missing = 1). Other demographics are in the supplementary materials.

To minimize sampling bias, we actively targeted participants who had indicated previously on TurkPrime that they self-identified as either liberal ($n = 460$) or conservative ($n = 399$). Data was collected in July 2019, took 10 minutes, and participants were paid \$US1 compensation. The Study 2 procedure was the same as Study 1, except that participants' climate change belief was asked before they randomly received one of the three messages.

Measures.

We employed the same measures in Study 2 except for the changes outlined below. Participants' strength of American identity was measured using the single-item measure ('I identify with Americans', 1 = strongly disagree, 7 = strongly agree) (Postmes et al., 2013). A single-item measure of political orientation was employed ('In politics people sometimes talk of liberals and conservatives. Where would you place yourself?', 1 = very liberal, 7 = very conservative). The messages contained the same content as Study 1 except that we replaced all Australian information with American relevant information, and manipulation checks indicated that the manipulations were once again effective (see supplementary materials for analyses).

Climate change beliefs

Belief that climate change is occurring was measured with a categorical item before participants were presented with their randomly allocated message (Greenhill, Leviston, Leonard, & Walker, 2014). Analyses revealed that believing climate change was occurring (either naturally or human induced) was associated with a significant, positive increase in mitigation and adaptation policy support when compared to those who denied climate change or were unsure it was occurring. Therefore, participants who indicated they did not believe in climate change or were unsure were excluded from the final analyses (excluded $n = 83$; more details can be found in the supplementary materials).

Results

We used the same R packages as in Study 1 to conduct all analyses.

Descriptives.

Table 4 presents descriptives for the major continuous variables in Study 2.

Table 4

Means, Standard Deviations, Correlations, and Reliability Estimates for Study 2

Variables	<i>M</i>	<i>SD</i>	α	ω	1	2	3
1. American Identity	5.32	1.35					
2. Political Orientation	3.78	1.98			.40** [.35, .46]		
3. Mitigation Policy Support	5.82	1.18	.91	.94	-.20** [-.26, -.13]	-.53** [-.57, -.48]	
4. Adaptation Policy Support	5.59	1.12	.85	.88	-.09** [-.16, -.02]	-.36** [-.42, -.30]	.72** [.68, .75]

Note. $N = 859$. M = Mean. SD = Standard Deviation. α = Cronbach alpha. ω = McDonald's Omega. Values in square brackets indicate the 95% confidence interval for each correlation. All scales measured on a 1 to 7 scale.

* $p < .05$. ** $p < .01$.

Overall, participants mostly identified as American, and support for both mitigation and adaptation policies were high in the sample. There was a moderate, positive relationship between American identity and political orientation, suggesting that identifying as an American was positively associated with being conservative. While American identity had weak, negative relationships with both policy support types, political orientation had a strong, negative relationship with mitigation policy support, and a moderate, negative relationship with adaptation policy support.

Like in Study 1, removal of participants who failed attention checks resulted in uneven participant numbers in the three message frame groups ($N = 859$, economic loss $n = 294$, national identity loss $n = 278$, control $n = 287$). Therefore, we also conducted two one-way ANOVAs to

check whether there were any meaningful participant differences on Australian identity and political orientation according to which condition participants were randomly allocated to.

For American identity, there was no significant difference between participants who received an economic loss message ($M = 5.29$, $SD = 1.37$), a national identity loss message ($M = 5.27$, $SD = 1.35$), or a control message ($M = 5.39$, $SD = 1.33$), $F(2,856) = .69$, $p = .503$, $\text{partial } \eta^2 = .00$. There was also no significant difference between participants who received an economic loss message ($M = 3.76$, $SD = 1.94$), a national identity loss message ($M = 3.89$, $SD = 1.99$), or a control message ($M = 3.70$, $SD = 2.01$) on their level of political orientation, $F(2,856) = .67$, $p = .509$, $\text{partial } \eta^2 = .00$. Therefore, it appeared randomisation was still successful despite participant numbers differing slightly per condition post data cleaning.

Direct and Interactive Effects on Climate Change Policy Support in the U.S.

We used the same data analytic approach as Study 1, conducting moderated multiple regressions and using planned contrasts to compare the effectiveness of the message types on both dependent variables. We again conducted a sensitivity power analysis post data collection. A final sample size of 859 was found to deliver 80% power to detect an r-square of .016 or greater, with six predictors, at an alpha of .05.

For the outcome variable of mitigation policy support (Table 5), there was no significant effect of message type suggesting that the message frames did not influence this type of policy support. However, a significant negative effect of political orientation emerged, once again providing support for H1. Participants who identified as conservative and believed in climate change were less likely to support mitigation policies, when controlling for American identity. There was no direct effect of American identity on mitigation policy support. We also obtained

no support for H2; there was no statistically significant political orientation x message type interactions observed on mitigation policy support.

For the outcome variable of adaptation policy support (Table 6), we did not find a significant direct effect of message frame. However, a significant negative effect of political orientation emerged, providing further support for H1. Americans who identified as conservative and believed in climate change were less likely to support adaptation policies, when controlling for American identity. Unlike Study 1, we did not unexpectedly find a direct effect of American identity on adaptation policy. Contrary to H2, there were no significant political orientation x message frame type interactions observed on adaptation policy support.

Table 5

Hierarchical Moderated Multiple Regression of Mitigation Policy Support for Study 2

	β	β 95% CI	sr^2	sr^2 95% CI	R^2	ΔR^2
Step 1					.004 [.00, .02]	
Message (interventions vs control)	-.07	[-.17, .02]	.00	[-.00, .01]		
Message (national identity vs economic)	.04	[-.04, .13]	.00	[-.00, .01]		
Step 2					.281** [.23, .33]	.277** [.23, .33]
American Identity	.02	[-.04, .08]	.00	[-.00, .00]		
Political Orientation	-.53**	[-.60, -.47]	.24	[.19, .29]		
Step 3					.285** [.23, .33]	.004 [-.00, .01]
Political Orientation x Message (interventions vs control)	-.07	[-.15, .01]	.00	[-.00, .01]		
Political Orientation x Message (national identity vs economic)	.04	[-.03, .11]	.00	[-.00, .00]		

Note. $N = 859$. β = standardized regression weights. sr^2 = semi-partial correlation squared. R^2 = coefficient of determination. ΔR^2 = change in R^2 . 95% CI = 95% confidence interval.

Square brackets enclose the lower and upper limits of a 95% confidence interval.

* $p < .05$. ** $p < .01$.

Table 6

Hierarchical Moderated Multiple Regression of Adaptation Policy Support for Study 2

	β	β 95% CI	sr^2	sr^2 95% CI	R^2	ΔR^2
Step 1					.005 [.00, .02]	
Message (interventions vs control)	-.08	[-.17, .02]	.00	[-.00, .01]		
Message (national identity vs economic)	.05	[-.03, .13]	.00	[-.00, .01]		
Step 2					.139** [.10, .18]	.134** [.09, .18]
American Identity	.07	[-.00, .13]	.00	[-.00, .01]		
Political Orientation	-.39**	[-.46, -.32]	.13	[.08, .17]		
Step 3					.140** [.09, .18]	.001 [-.00, .00]
Political Orientation x Message (interventions vs control)	-.00	[-.09, .08]	.00	[-.00, .00]		
Political Orientation x Message (national identity vs economic)	.03	[-.05, .11]	.00	[-.00, .00]		

Note. $N = 859$. β = standardized regression weights. sr^2 = semi-partial correlation squared. R^2 = coefficient of determination. ΔR^2 = change in R^2 . 95% CI = 95% confidence interval.

Square brackets enclose the lower and upper limits of a 95% confidence interval.

* $p < .05$. ** $p < .01$.

Discussion

In Study 2, we collected a sample of United States citizens and/or residents who believed climate change was occurring to investigate the relationship between climate change loss messages and policy support, and to test whether this relationship was moderated by conservative political orientation. We also controlled for American identity. As hypothesized and consistent with Study 1, conservatives were less likely to support mitigation and adaptation policies, and this negative direct effect was stronger in the context of mitigation policies than adaptation policies (Bateman & O'Connor, 2016). However, unlike in Study 1, there was no direct effect of American identity on support for adaptation policies. Therefore, those identifying as an American were not more likely to support adaptation policies. We also found no significant political orientation x message type interaction on mitigation or adaptation policy support. However, it must be noted that mitigation and adaptation policy support was once again high across all message conditions (as seen in Study 1). Given we only obtained participants who believed in climate change in Study 2, thereby accounting for the impact that climate change deniers may have had in Study 1, it is possible that some potential differences were reduced or not observed in this study due to ceiling effects.

General Discussion

The aims of this present research were twofold. Our first aim was to investigate whether an economic loss or national identity loss message increased climate policy support (mitigation, adaptation) when compared to one another and to a control message in Australia (Study 1) and the United States (Study 2). Secondly, as right-wing adherents are less likely to support climate change policy in these countries, but national identity is typically related to conservatism, we also aimed to test whether the effectiveness of these climate messages was conditional on

identifying as politically right-leaning (Study 1 in Australia) or conservative (Study 2 in the U.S.). As one of our message types threatened national identity (i.e., national identity loss message), we also measured participants' level of national identification to control for its potential effect on the variables of the study.

Across the two studies, we found a direct, negative effect of political orientation on climate change policy support. When controlling for Australian (Study 1) or American (Study 2) identity, right-wing adherents were less likely to support mitigation and adaptation policies. This is consistent with previous research that has shown that those who are politically left-leaning in Australia and the United States are more likely to support climate change policies and action when compared to their right-wing counterparts (Fielding et al., 2012; Hornsey et al., 2018; Dunlap et al., 2016; Unsworth & Fielding, 2014). Interestingly, this negative relationship was more pronounced with mitigation policy support in both Australia (Study 1) and the United States (Study 2), suggesting that conservative respondents were less hostile to adaptation policies than mitigation policies. Mitigation policies are focused on limiting the severity of climate change, primarily through reducing carbon emissions via governmental policy. Therefore conservatives may either be less concerned about the severity of climate change, believe reducing carbon emissions is a less appropriate course of climate action, or more resistant to governmental policies which rely on changes to the current socio-economic or tax system (e.g., the carbon tax). This may be due to the varying level of socio-economic change mitigation and adaptation strategies require. Mitigation policies typically involve substantial changes, and therefore threats, to the current socio-economic and cultural system as they aim to limit the existing impacts of climate change through governmental intervention, which right-wing adherents are particularly sensitive and reactive to (Clarke et al., 2019; Feygina et al., 2012).

Adaptation policies, on the other hand, are strategies which typically fit into the current socio-economic and cultural system and do not require an acceptance that the impact of climate change is severe. Furthermore, although adaptation policies are driven by governments, they require less systemic change and so may therefore be seen as less threatening to right-wing adherents. Future research should investigate the varying reactions to mitigation and adaptation policies, and whether these are conditional on political orientation, to fully understand these potential differences.

In terms of the effectiveness of loss messages (economic, national identity) when compared to one another and to a control message, findings from both studies showed that support for climate policy was not influenced by message loss type, and that there was no conditional effect of political orientation on responses to these messages. This suggests that attempting to generate communications that emphasize loss and that align with conservative economic (economic growth) or cultural (nationalism) values may be unable to reduce politicization of climate change in Australia (Study 1) and the U.S. (Study 2). While this finding was unexpected, it is unlikely due to issues with our manipulations or that participants were unable to distinguish between the economic or national impacts of climate change. Participants who had received a national identity loss message perceived that climate change would impact the Australian (Study 1) or American (Study 2) way of life when compared to those who received the economic message (and vice versa) (see supplementary materials for these analyses). These findings contrast with prior research which shows pro-environmental, patriotic messages are well received by conservatives (Feygina et al., 2010; Wolsko et al., 2016) and those right-wing adherents are open to protecting the environment if it also means protecting national interests (McCright & Dunlap, 2014). Nonetheless, the findings do align with emerging

research that demonstrates that messages that attempt to align with conservative beliefs do not reduce political polarization of climate change (Chinn & Hart, 2021) or can even lead to some form of reactance, with right-wing adherents viewing climate change policy as less important post-message (Singh & Swanson, 2017). It is also important to note that the source of our message were university scientists, and while generally trusted, these may not be trusted by right-wing adherents when it comes to climate change. While not the same source employed in our study, recent research has demonstrated left-leaning sources result in more positive attitudes towards climate policies for left-wing adherents, yet this does not occur when right-leaning sources present the same information to right-wing adherents (Fielding et al., 2020). Therefore, future research should further investigate whether loss messages that tap into traditional conservative economic (economic growth) or cultural (nationalism) values may work in specific countries, with policy types, and with certain sources (e.g., political in-group members).

An unexpected finding of the current research was that we found a positive, unique effect of participant national identity on support for adaptation policy in our Australian sample (Study 1). While this effect was smaller than political orientation in both studies, those who more strongly identified as Australian were more likely to support adaptation policies, but not mitigation policies. Firstly, this suggests that it is still possible to utilize national identity as a potential driver of adaptation policy support, especially in Australia, which is less politically polarized than the United States (Finkel et al., 2020). This is because while prior research shows that nationalism is positively related to right-wing ideologies in the United States (Roccas et al., 2010), there was only a weak, positive relationship between Australian identity and right-wing orientation in our research. Further still, prior research suggests that Australians do view ‘caring for the environment’ as an important part of their national identity (Purdie & Wilss, 2007).

Secondly, this unexpected finding suggests that adaptation policies, which are focused on adapting to the negative environmental effects of climate change, may have different psychological antecedents to those policies which are focused on limiting the severity of climate change. As noted above, mitigation policies tend to result in system change (Clarke et al., 2019), while adaptation policies typically result in changes within an existing system. Therefore, it is possible that those who strongly identify with their national social group find small changes in a system they already value (i.e., their country) more palatable. Future research should explore the utility of national identity as an antecedent to adaptation policy support and see whether it could be more effectively employed in climate change communication, especially in Australia.

Limitations

The current research provided an experimental test of whether economic loss or national loss messages may contribute to climate change policy support across two different countries – Australia (Study 1) and the United States (Study 2). While political orientation does contribute to climate change outcomes in these countries, it is possible that different effects may arise in other countries where climate change is not politically polarizing (Smith & Mayer, 2019).

Furthermore, the findings across the two studies did differ somewhat, suggesting potential country-level differences in how individuals respond to climate change communications.

Although prior research demonstrated that national identity is related to political conservatism in Anglosphere nations, we did not find this in the Australian context in Study 1 (there was only a weak relationship), and so its ability to accentuate the impact of political conservatism may have been weaker than in the U.S. context. Finally, while there was appreciable variability within conditions, the average endorsement of policies was reasonably high across all groups in both studies. As such, this may limit inference to those strongly opposed to adaptation and mitigation

strategies and may further have put a limit on the size of the observable effects due to measurement ceilings.

Conclusion

Across two studies, and in line with prior research, we found that identifying as politically right-leaning (in Australia, Study 1) or conservative (in the United States, Study 2) was negatively related to both mitigation and adaptation policy support, providing further evidence that governmental climate action is politically polarized in these nations. Yet, we also found that Australian (Study 1) identity was uniquely and positively predictive of adaptation policy support, but not mitigation policy support. This suggests that different psychological variables may predict different types of climate policies, and in the case of this research, those who identify as an Australian appear more likely to support policies which simply adhere to the current political environment rather than change the socio-economic and cultural system. Findings across the two studies also showed that an economic loss and national identity loss message did not result higher mitigation and adaptation policy support when compared to one another or to a control, and this was not conditional on right-wing political attitudes. These findings suggest that if one must discuss climate change, describing the threat to cultural symbols and national environmental icons, or the potential economic losses if we do not act on climate change, may do little to increase climate policy support in right-wing adherents.

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Statements and Declarations

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Competing Interests

The authors declare no competing interests.

Author Contributions

All authors contributed to conceptualisation and writing the manuscript. AK analysed the data.

Data Availability

The datasets generated during and/or analysed during the current study are not publicly available as the conditions of ethical approval does not allow for this. However, they are available from the corresponding author on reasonable request.

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