Title

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Abstract

Coping can help people deal with the imminent and distant effects of climate change and encourage people to take the necessary pro-environmental behaviors. The present research examines whether use of specific coping strategies depending on construal level can significantly affect one's pro-environmental intentions. We found that inducing a match between climate change construal and type of coping strategy significantly predicted belief in climate change, while creating a mismatched condition did not. These findings aim to illuminate the relationship between coping strategy and level of construal, and how facilitating a greater match between them may promote more successful psychological adaptation.

With the threat of climate change becoming more imminent, widespread efforts are needed to prevent irreversible damage towards the planet. Along with the ecological and physical impacts, climate change also holds significant social and psychological consequences for people, especially for groups that are at greater psychological risk. Typically, these are people with a marginalized pre-disaster existence, such as the rural and urban poor, and racial and ethnic minorities (Cutter, 2003). The psychological impacts of climate change may take form as direct, which are the acute or traumatic effects of extreme weather events and a changed environment, or indirect, which include threats to emotional wellbeing based on observation of impacts and concern or uncertainty about future risks. Psychologists can play a pivotal role by helping people target the emotional responses to these impacts, which often are higher levels of anxiety and worry, depression, grief, and apathy (Doherty et al., 2011). In order to mitigate these negative feelings, people may cope in different ways, using problem and emotion-focused coping strategies.

Coping is a crucial part of the psychological adaptation process to climate change. Some coping strategies may be maladaptive and lead to lower amounts of pro-environmental behaviors, including increased apathy or feelings of overwhelmingness. For instance, people may choose to distance themselves from the issue and perceive it as a faraway threat that is likely to affect the world in the future. In the context of climate change, coping is successful if it leads to an increase in pro-environmental behavior. For instance, talking to others about global environmental problems about how further consequences can be prevented, and how to better prepare for future events, allows people to engage with different contexts of the issue and come up with realistic solutions (Helm et al., 2008; Reser & Swim, 2011). Coping is crucial to study to further engage people in thinking about difficult environmental issues and encourage them to adopt important pro-environmental behaviors and policies.

However, before further engaging people in the issue, it needs to be agreed upon that climate change is a global, irreversible threat which needs to be addressed immediately. There tends to be a discrepancy between public attitudes and scientific findings, with many Americans tending to underestimate the severity of this issue. The impacts of climate change are often perceived by Americans as more abstract, or not personally relevant, uncertain, and psychologically distant (Gifford, 2011). This is an issue because although more affluent countries are more responsible for the effects of climate change, it is disproportionately affecting less affluent countries and communities (Islam & Winkle, 2017). The role researchers must assume is to understand how people cognitively

endeavor the imminent and distant threats of climate change. Understanding how to frame messages to be more consistent with the way people cope in constructive ways can help increase climate change engagement.

Message framing is important to garner persuasion amongst the public. In thinking of how to cultivate structural and cultural change, many politicians, educators, and policy makers, for instance, realize the importance of communicating climate change effectively. One of the main areas of interest for environmental psychologists is examining how persuasive messages can be improved upon to change or increase people's attitudes towards taking environmental behaviors and cognitively adapting to climate change. We will examine this argument more in depth through a Regulatory Fit Theory (Higgins et al., 2002) and Construal Level Theory (Trope & Liberman, 2010) perspective to coping. We will approach the issue through a combined framework of matching Construal Level Theory with coping strategies.

Coping strategies can be analyzed through a Construal Level Theory framework. Construal Level Theory describes the relationship between one's psychological distance to an object or event and how abstractly or concretely a person thinks about it (Trope & Liberman, 2010). A concrete construal is reflective of low-level thinking where people are focused on the present in greater detail. For instance, asking a student how they can reduce their carbon footprint would require them to think about more specific, immediate details, such as reducing meat intake or biking more. An abstract construal reflects high-level thinking where the individual is concerned on the broader picture and more on the gist of the object or situation. An example of this would be asking a student why they should reduce their carbon footprint, requiring them to focus on overarching values and goals, such as thinking of future generations or wanting to preserve nature. Problem-focused coping involves taking concrete steps, such as taking direct actions towards diminishing the source of the stressor directly. This suggests that the individual has a low-level construal mindset and more psychological proximity. Likewise, emotion-focused coping involves distancing oneself from the stressor, such as regulating the negative emotions surrounding the stressor instead of the actual source. This suggests a high-level construal mindset and greater psychological distance.

Prior research that examines message fit and mindset, which studies the match between the recipient's regulatory focus with the intended message, support this framework. For example, studies suggest that individuals who adopt emotion-focused coping mentally represent their coping at higher-level construal (Todorov et

al., 2007). Han et al. (2016) demonstrated that when participants were given a coping strategy that matched the construal level of an advertisement they read, it led to a match in mindset and they were more likely to adopt the health behavior than participants in mismatched conditions. Therefore, facilitating a match between construal level and coping strategies may increase positive adaptation to climate change.

The purpose of this research is to identify a relationship between coping and Construal Level Theory and if facilitating a match between the two in the context of climate change will influence people's beliefs and intentions. Although prior research has studied climate change under the lens of construal level and proximizing psychological distance, results have been inconsistent. Additionally, there has been little research on how coping can be maximized especially in the realm of environmental issues. We seek to provide to provide a more nuanced perspective by exploring how proximal and distant views of climate change can both be effective for support if paired with the matching coping strategy. We hypothesize that individuals will demonstrate higher pro-environmental intentions when they utilize a coping strategy that is congruent with the construal level of a message because they will have a "fit" in mindset.

Method

Participants & Design

We recruited a convenient sample of American adults (N = 310) on Amazon's MTurk, which was then reduced to 293 after eliminating 17 participants who did not consent or did not write in a response for the coping condition. Participants were given $1.50 for participating in this study. Participants were assigned to a 2 (construal level of climate change) x 2 (coping strategy) between-subjects experimental design with two independent variables and four dependent variables. In total, there were four different experimental conditions (concrete and problem-focused, concrete and emotion-focused, abstract and problem-focused, and abstract and emotion-focused) and participants were randomly assigned to one.

Table 1

Participant demographics, N = 293

Age	Mean = 37.6 years *SD* = 10.4
Gender	140 Male, 155 Female
Ethnicity	74.4% White or Caucasian, 10.9% Black or African American, 6.8% Asian or Pacific Islander, 5.1% Latinx or Hispanic, 1% selected multi-racial, .03% American Indian or Alaskan Native, .3% Middle Easter, .3% selected other,
Political background	52.6% were Democrat, 29% were Republican, 18.4% selected other
Education	42.3% completed a bachelor's degree, 20.1% completed some college, 14% completed an associate degree, 11.95% completed a master's degree or higher 10.6% completed high school, and .7% completed junior high.

Materials

Independent Variables

    Climate change construal. For the first manipulation in this study, we used images from Duan et al.'s (2019) study, which was found on various websites. We chose these images to replicate the similar effect of inducing participants into a more concrete or abstract mindset regarding climate change. Participants were told that they would view a total of nine images. They were shown one image at a time, with the next button appearing at the bottom of the page after twenty seconds, to ensure that they do not skip through the images. The concrete condition contained colored photographs that focused on specific individuals and places and emphasized the consequences of climate change. The concrete condition was intended to bring the issue of climate change psychologically closer to the participant by depicting natural disasters and their effects to people and the communities, as also depicted in the captions. The abstract condition contained black and white pictures that depicted graphs and maps and focused on the causes of climate change.

Figure 1

Example items from the climate change construal. Concrete (left), Abstract (right).

Coping strategy. This manipulation was inspired by the coping strategy manipulation in Han et al.'s (2016) study, which was based off Miller (2008). However, we included sub-strategies to help prevent people from using maladaptive emotion-focused coping strategies, and to try to keep the strategies parallel to each other, reducing noise. The sub-strategies were chosen based on prior research regarding how people coped with environmental issues and climate change, and if they were more beneficial for increasing pro-environmental attitudes and behaviors. Participants were told that either problem- or emotion-focused coping was found by psychologists in North America to be the most beneficial when thinking about climate change. They were given three sub-strategies of how the main

strategy could be used and were asked to list three ways they could apply it towards thinking about climate change.

Table 2

Coping strategies and the sub-strategies

Problem-Focused	Emotion-Focused
Seeking instrumental social support – Gathering information about the situation, reaching out to others who can help.	*Seeking emotional social support –* Seeking support from other people such as comfort and empathy (not for resources).
Planning – Thinking ahead and becoming prepared.	*Reappraising the situation -* Thinking of the negative situation in a more positive light.
Direct actions - Informing others of what they need to do, providing instrumental/emotional support, specific actions.	*Acceptance of the situation –* Acknowledging problem exists rather than denying it.

Dependent Variables

    Climate Change Belief scale. We had participants complete the Belief in Global Climate Change scale (12 items, a = .94), adopted from Heath & Gifford (2006), which assesses the extent to which people believe global climate change is occurring, and is caused by human activity. They were asked to indicate how much they agreed with each statement using a 7-point Likert scale (e.g., "How likely do you think that global warming is occurring now?"), ranging from 1 = Strongly Disagree to 7 = Strongly Agree, where higher scores indicate a higher level of belief in human caused climate change.

    Climate policy support scale. Participants completed the Support for Climate Policy scale (7 items, a = .81), adopted from Ding et al. (2011). The scale asks participants how much they support or oppose a number of environmental policies proposed in the United States (e.g., "Requiring electric utilities to produce at least 20% of their electricity from renewable sources"), ranging from 1= Strongly Oppose to 7 = Strongly Support.

    Pro-Environmental Behavioral intentions scale. Participants responded to the Pro-Environmental Behavioral Intentions scale (6 items, a = .77), which uses Eom's modification of Zaval et al. (2015). The scale asks participants to indicate how often they intend to perform the following behaviors (e.g., "Use public transportation or carpool"), on a 6-point Likert-scale, ranging from 1 = Never to 6 = All the time.

    General Confidence in Society scale. Participants responded to the General Confidence Scale (6 items, a =.75), adopted from

Keller et al (2016). The scale asks participants to respond to various statements regarding society's ability to mitigate large threats (e.g., "Our society is well equipped to solve future problems"), on a 7-point Likert scale, ranging from 1 = Highly Disagree to 7 = Highly Agree.

Procedure

After participants provided their informed consent, we randomly assigned participants to either a concrete or abstract depiction of climate change. Then, after receiving the climate change construal condition, participants were randomly assigned to a coping strategy condition. After they completed this, participants filled out four different scales for climate change belief, climate policy support, pro-environmental behavioral intentions, and general confidence in society. Participants then filled out a demographic questionnaire including gender, age, ethnicity/race, education, subjective socioeconomic status, and political identification. Finally, participants were debriefed about the true nature of the study and were asked to complete a secondary consent form which allowed them to withdraw their data from analyses if they wished.

Results

Table 3

Relationship between dependent variables

	Climate Change Belief	Climate Policy Support	Pro-Environmental Behavioral Intentions	General Confidence in Society
Climate Change Belief	--			
Climate Policy Support	.729**	--	.	
Pro-Environmental Behavioral Intentions	.315**	409**	--	
General Confidence in Society	-.456**	-.245**	.078	--

*p < .05, **p < .01 (two-tailed test).

First, we looked at the bivariate relationships between key variables (see in Table 1). All key dependent variables, except for general confidence in society and pro-environmental behavioral intentions, were positively correlated to each other. We conducted a 2 (climate change construal) x 2 (coping strategy) ANOVA for each of the following dependent variables. There were no significant findings for pro-environmental behavioral intentions or general confidence in society.
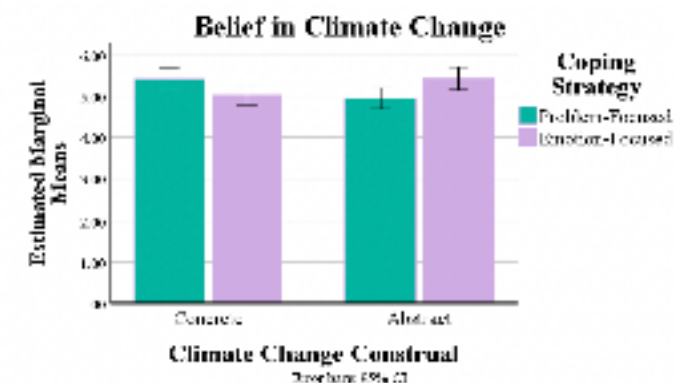
Climate Change Belief

There was no significant main effect of climate change construal, F(1,289) = .062, p = .804. Participants who received the concrete construal condition (M = 5.230, SD = .092) had very similar scores to those who received the abstract construal condition (M = 5.197, SD = .095). In other words, the portrayal of climate change as either more concrete or abstract did not affect people's overall belief in climate change.

There was no significant main effect of coping condition, F(1,289) = .093, p = .761. Participants who received the problem-focused condition (M = 5.193, SD = .095) had similar scores to those who received the emotion-focused condition (M = 5.233, SD = .091). That is to say, the type of coping strategy people applied to climate change, either problem- or emotion-focused, did not affect their belief in climate change.

We wanted to explore if a match between our independent variables predicted for belief in climate change. There was a statistically significant interaction between the effects of climate change construal and coping strategy on belief in climate change, F(1, 289) = 10.599, p = .001. For those who received the concrete images of climate change, problem-focused coping led to greater belief in climate change (M = 5.428, SD = .139) than emotion-focused (M = 4.958, SD = .130). For those who received the abstract images, emotion-focused coping (M = 5.436, SD = .138) led to stronger belief than problem-focused coping (M = 5.031, SD = .120). In other words, when participants received the concrete condition and gave examples of problem-focused coping strategies, as well as those who received the abstract condition and gave examples of emotion-focused coping strategies, they also showed greater belief that climate change is caused by human activities and is happening now, compared to other groups. This finding was congruent with our hypothesis.

Figure 2

Matching Climate Change Construal to Coping Strategy Increases Climate Change Belief

Climate Policy Support

There was no significant main effect of climate change construal, $F(1,289) = .000$, $p = .998$. Participants who received the concrete construal condition ($M = 3.941$, $SD = .058$) had similar scores to those who received the abstract construal condition ($M = 3.941$, $SD = .061$). This means that no matter how climate change was portrayed, as either more concrete or abstract, it did not affect participants' support for climate policy.

There was no significant main effect of coping condition, $F(1,289) = .078$, $p = .780$. Participants who received the problem-focused condition ($M = 3.929$, $SD = .061$) had similar scores to those who received the emotion-focused condition ($M = 3.952$, $SD = .058$). In other words, the certain type of coping strategy people applied to climate change did not affect their support towards various climate policies.

There was a marginally significant interaction between the effects of climate change construal and coping strategy on support for climate policy, $F(1, 289) = 3.231$, $p = .073$. For those who received the concrete images of climate change, problem-focused coping led to greater support for climate policy ($M = 4.028$) than emotion-focused coping ($M = 3.853$). For those who received abstract images, emotion-focused coping ($M = 4.004$) led to stronger support than problem-focused coping problem-focused ($M = 3.877$). In other terms, when participants received the concrete condition and gave examples of problem-focused coping strategies, as well as those who received the abstract condition and gave examples of emotion-focused coping strategies, they also showed greater support for proposed climate policies, compared to other groups. This finding was congruent with our hypothesis

Figure 3

Matching Climate Change Construal to Coping Strategy Increases Climate Policy Support
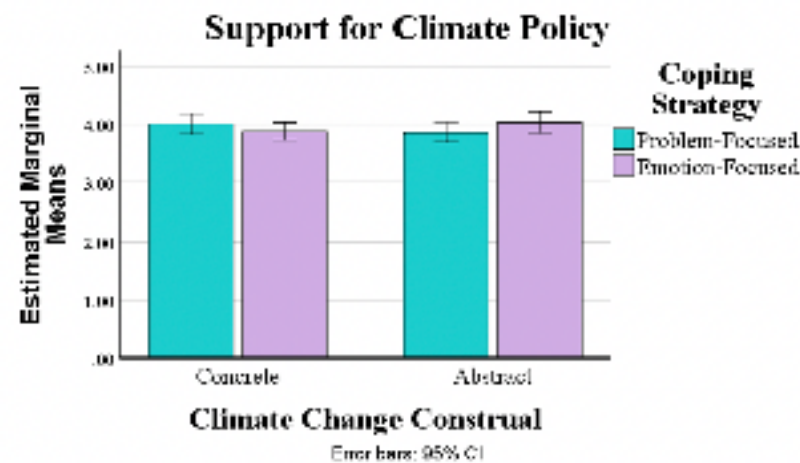
Discussion

The current study sought to discover how altering the construal of climate change and strategically combining that with coping strategies can lead to an increase in message fit and overall support in pro-environmental intentions regarding climate change. Based on prior research on this topic, we hypothesized individuals who were induced into a match between construal level and coping strategy conditions would show higher pro-environmental intentions and beliefs, than individuals not in matched conditions.

We found that participants in matched groups: concrete construal and problem-focused, as well as abstract construal and emotion-focused, showed higher belief in climate change than participants in mismatched groups. Additionally, we found that those in matched groups also demonstrated a slightly higher support for climate policy. We speculate that these results are due to participants feeling more of a match in their mindsets, with belief being easier to change and policy having more nuance. There were no significant findings for pro-environmental behavioral intentions and general confidence in society. This may be because individual behaviors may be more difficult to connect with the overarching goal of mitigating climate change. Additionally, general confidence in society was positively related with higher income. Typically, individuals from higher socioeconomic status are more removed from the consequences of climate change.

Implications

The current study sheds light on the further possibilities of using construal level and coping strategies to increase message fit. This research may be crucial for communicating scientific findings through media. Duan et al (2017) examined many popular U.S. Newspapers and found that climate change was generally construed as concrete, however, more conservative newspapers would describe the topic as more abstract through inducing skepticism and portraying it as a future problem. Understanding how different groups may view climate change based on the media they are most exposed to is the first step towards implementing the most effective action to bring about change. Different coping strategies can help engage people further into the issue and have them draw on important values and enforce their self-efficacy in being able to act. Follow up actions to messages need to be consistent with the expectations people are experiencing, as prior research has demonstrated to get the best mindset-message fit and higher willingness to partake in new behaviors.

Limitations and Future Directions

A main limitation of the study was that we lacked a representative sample, as participants were conveniently recruited from Mturk. Therefore, findings cannot be generalized to the U.S. adult population. Having a more representative sample would allow researchers to understand the nuances between different groups, as prior research has found that there are culture specific predictors for environmental action (Eom et al., 2016). Another limitation was that we were unable to know if the independent variable for climate change construal achieved its purpose. In the future, including a manipulation check such as the behavioral identification form, would allow researchers to know if participants mindsets are reflective of more low level or high-level thinking.

Conclusion

This research provides a social psychological perspective to the crucial issue of climate change. In this study, we sought to highlight how climate change is a tricky topic to present to the public due to its complexity of being both a proximal and distal threat. Additionally, coping, while important as a mediator for environmental behaviors, may be counterintuitive if applied in the wrong context. We found evidence that showed how construal level and coping strategies can be effectively combined to increase belief and support for policy, suggesting that regulatory fit can be induced through different frameworks. These findings are similar to research by Han et al (2016) and furthers their research by applying the framework towards the realm of environmental issues. Overall, this research contributes to literature on message fit and its role in promoting psychological adaptation to climate change.

Acknowledgements

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