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Nature Connectedness in the Climate Change Context: Implications for Climate Action and Mental Health

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A sense of psychological connectedness with the natural world has important benefits for global health. In a time of environmental crisis, however, it may also be accompanied by mental health risks. We used national survey data collected after a severe Australian bushfire season (N = 3,875) to test a path model of the relationships between nature connectedness, worry about climate change, individual and collective climate action, and psychological distress (depression, anxiety, stress). We found that nature connectedness was positively associated with climate worry that, in turn, was positively associated with climate action and psychological distress. Whereas taking individual climate action was associated with reduced psychological distress, taking collective climate action had the opposite effect. Our findings provide new insights into potential processes underlying the association between nature connectedness and mental health in the climate change context and point to an urgent need to protect the well-being of people engaging in collective climate action.

What is the significance of this article for the general public?

Our findings suggest that a stronger sense of connection with nature can promote climate change engagement and action, but this may come with mental health risks. Hence, public policy and interventions targeting nature connectedness may benefit from incorporating strategies to help people manage climate-related psychological distress, especially in contexts of environmental change.

Keywords: nature connectedness, climate worry, pro-environmental behavior, psychological distress, climate change

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Nature connectedness offers a promising global health target. Those more connected with nature engage in more pro-environmental behavior and report higher well-being (Capaldi et al., 2014; Mackay & Schmitt, 2019; Pritchard et al., 2020; Whitburn et al., 2020). Furthermore, growing evidence indicates that nature connectedness is malleable; it can be increased using simple strategies that encourage deeper engagement with the natural world (Richardson et al., 2020). As such, nature

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connectedness has attracted increasing interest from interdisciplinary researchers and policy makers as a lever for building more sustainable and resilient societies (Ives et al., 2018; Richardson et al., 2020; Riechers et al., 2021).

In a changing climate, however, a stronger connection with nature may also come with mental health risks. Burgeoning evidence shows that climate change and other environmental threats can generate emotional distress (e.g., worry, anxiety, grief; Hogg et al., 2021; Ojala et al., 2021), especially among those who value the natural world (Bouman et al., 2020; Cunsolo & Ellis, 2018). Negative emotions are largely overlooked in the nature connectedness literature (Chawla, 2020), yet they may have important implications for public policy and interventions aimed at strengthening human-nature relations in a time of global environmental crisis.

This study uses national survey data collected in the wake of a devastating Australian bushfire season to examine the relationships between nature connectedness, climate worry, individual and collective climate action, and psychological distress (depression, anxiety, and stress). We integrate research on nature connectedness and coping with climate change to propose that while individuals who feel a stronger connection with nature are more likely to worry about climate change, they are also more likely to take action to mitigate the threat, and that these processes will have opposing effects on mental health.

Nature Connectedness and Mental Health

Nature connectedness is a psychological construct that reflects an individual's subjective relationship with the natural world (Mayer & Frantz, 2004). It encompasses an array of thoughts, emotions, and experiences that together promote a sense of interdependence with nature (Nisbet et al., 2009). Nature connectedness is associated with a range of positive mental health outcomes, including greater life satisfaction, vitality, and personal growth (Capaldi et al., 2014; Pritchard et al., 2020). It has also been shown to predict lower state and trait anxiety (Martyn & Brymer, 2016) and lower risk of clinical anxiety or depression (Richardson et al., 2021), suggesting that nature connectedness might also protect against negative mental health outcomes.

Other studies, however, have found that nature connectedness was unrelated to negative affect or depression (Nisbet et al., 2011; Zelenski & Nisbet, 2014). Moreover, Dean et al. (2018) found that nature connectedness predicted higher psychological distress (depression, anxiety, stress) among people living in Brisbane, Queensland. This research used survey data collected shortly after one of the worst floods in the city's history, and in a context where environmental protection laws had recently been dismantled. The authors surmised that intensifying threats and losses to nature might explain the unexpected results. While Dean and colleagues' reasoning was post hoc, their research dovetails with other work (e.g., Chawla, 2020; Larson et al., 2021) to suggest that environmental threat perceptions and responses might play an increasingly important role in the relationship between nature connectedness and mental health.

The Role of Climate Worry

Many people around the world experience *climate worry*: repeated thoughts and associated feelings about the current and future impacts of climate change (Ojala et al., 2021). Climate worry indicates personal engagement with the issue of climate change and is one of the strongest predictors of climate-related policy support and action (Brosch, 2021; van der Linden, 2017). These findings have triggered calls for more research to examine its antecedents and consequences (e.g., Bouman et al., 2020; Ojala et al., 2021).

There are several reasons to expect that nature connectedness predicts climate worry. Nature connectedness has been linked to stronger beliefs in climate change (Wang et al., 2019), climate change risk perceptions (Bradley et al., 2020), and climate change anxiety, an emergent construct that incorporates feelings of climate worry (Clayton & Karazsia, 2020). Furthermore, Bouman et al. (2020) recently showed that people who prioritize biospheric values (a construct closely related to nature connectedness; Martin & Czellar, 2017) report higher levels of climate worry. People who feel more connected with nature may be more worried about climate change because they perceive it as a threat to things they care deeply about (e.g., plants, animals, ecosystems; Wang et al., 2018) and to their own identity and well-being (Cunsolo & Ellis, 2018).

Although climate worry is a useful response in terms of motivating action, it may be associated

with negative mental health outcomes. In a recent study, Ogunbode et al. (2021) found that negative emotional responses to climate change (including worry) were associated with poorer self-reported mental health across 25 countries. Similarly, concerns about climate change have been linked to higher levels of psychological distress, both cross-sectionally (Searle & Gow, 2010) and over time (McBride et al., 2021). Hence, increased worry about climate change might be one pathway through which nature connectedness has a negative impact on mental health.

The Roles of Individual and Collective Climate Action

Several researchers have argued that taking action to mitigate climate change can protect against the well-being costs of worrying about negative environmental outcomes (e.g., Doherty & Clayton, 2011; Lawrance et al., 2021; Verplanken et al., 2020). In one of the few empirical studies on the topic, Schmitt et al. (2018) found that taking pro-environmental action partially offset a negative association between perceived ecological threat and life satisfaction. This finding is supported by broader evidence of a positive association between pro-environmental behavior and subjective well-being (Zawadzki et al., 2020). Few studies, however, have examined the relationship between pro-environmental action and negative mental health outcomes, such as depression, anxiety, and stress.

It is also unclear whether different types of climate action vary in their capacity to protect mental health. A common distinction in pro-environmental behavior research is between individual action, such as green consumption, and collective action, such as attending climate rallies (e.g., Walker et al., 2015). While both are performed by individuals to reduce climate change, collective action involves acting in concert with others to change the beliefs and behaviors of other people and organizations and so may have different drivers and consequences (Walker et al., 2015). Indeed, a recent meta-analysis found that collective action had a much weaker association with subjective well-being than individual forms of pro-environmental action, such as purchasing decisions (Zawadzki et al., 2020). Understanding how individual and collective climate action might differ in their associations with mental health has practical implications for helping people respond effectively to climate change.

Many studies have shown that people who have a stronger relationship with the natural world are more likely to take action to protect it (Mackay & Schmitt, 2019; Whitburn et al., 2020). Although earlier studies focused on individual behaviors, recent research has demonstrated that connecting with nature can also promote collective climate action (Mackay et al., 2021; Schmitt et al., 2019). Despite a plethora of studies investigating pro-environmental action and well-being as independent outcomes of nature connectedness, few studies have considered how they might impact each other. Furthermore, and given the potential for nature connectedness to contribute to mental ill-health, greater clarity about how nature connectedness is related to psychological distress is needed before calls for public interventions to strengthen the connection between people and nature are answered.

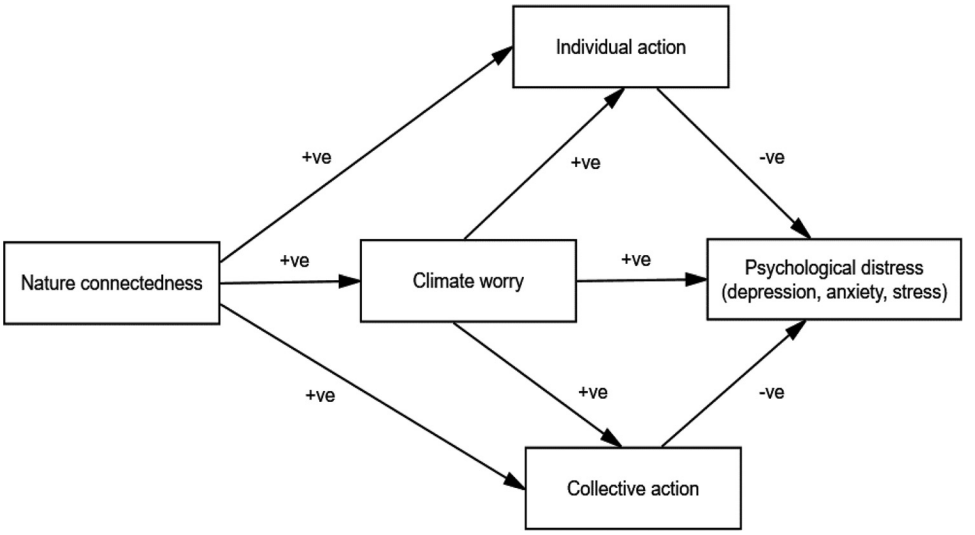
Current Study

The aim of this study was to better understand the associations between nature connectedness, climate action, and mental health in the climate change context. Based on the literature outlined above, we proposed a path model whereby nature connectedness relates to psychological distress via opposing pathways involving climate worry and climate action, thus helping to reconcile the mixed findings in the extant literature. We distinguished between individual and collective action to allow us to examine differences in their relationships with other variables (Walker et al., 2015). We tested our proposed model predicting three indicators of psychological distress (depression, stress, anxiety) in three separate models using national survey data collected 6 months after a severe Australian bushfire season that was widely attributed to climate change (Abram et al., 2021; Burgess et al., 2020).

Our hypothesized model is presented in Figure 1. Overall, we anticipated that nature connectedness would be associated with higher psychological distress (Hypothesis 1; Dean et al., 2018). We expected that this association would be indirect such that nature connectedness would be associated with increased climate worry that, in turn, would be associated with higher psychological distress (Hypothesis 2; McBride et al., 2021; Ogunbode et al., 2021). We further expected that nature connectedness would be directly and indirectly (via climate worry) associated with increased individual and collective climate action that, in turn, would be

Figure 1

Proposed Path Model of the Relationships Between Nature Connectedness, Climate Worry, Individual Climate Action, Collective Climate Action, and Psychological Distress



Note. +ve indicates a positive expected association, and −ve indicates a negative expected association between variables.

associated with lower psychological distress (Hypothesis 3; Schmitt et al., 2018).

Method

Participants and Procedure

The data used in this study were part of a larger project investigating climate change attitudes in Australia. Qualtrics, a large survey research provider, used quota sampling to recruit a representative sample of the Australian adult population based on age, gender, and location (state/territory). Qualtrics partners with approximately 20 online panel sample providers who invite participants from their databases of people who have agreed to be contacted to take surveys. Data were collected from August 20 to September 20, 2020, via an online survey. Participation was voluntary and anonymous, and the full survey took approximately 25 min to complete. Institutional ethics approval was granted prior to data collection.

Our sample consisted of respondents who answered all items relevant to this study (n = 3,886; 76% of the full sample) and was also nationally representative on age, gender, and location. Approximately half the sample identified as female (50.7%). Age ranged from 18 to 89 years (M = 47.03, SD = 17.49). Australia's high urbanization rate was reflected in our sample, with most participants living in a capital city (65.5%) or regional town (22.4%) and a minority living in a rural area (11.3%). Additional demographics for the full and final sample are presented in Table S1 in the online supplemental materials.

Measures

Only the measures used in this study are reported here. The exact wording of each measure is presented in Table S2 in the online supplemental materials.

Nature Connectedness

Nature connectedness was measured with the short-form version of the Nature Relatedness Scale (Nisbet & Zelenski, 2013). Participants responded to six items (e.g., "My relationship to nature is an important part of who I am") on a 7-point scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). Cronbach's alpha of .88 indicated good

internal consistency. Items were averaged to create a composite score.

Climate Change Worry

Participants were asked "How worried are you about global warming/climate change?". They responded on a 4-point scale from 1 (*not at all worried*) to 4 (*very worried*).[1]

Climate Action

Participants indicated their engagement over the past year in eight individual (e.g., recycling) and eight collective (e.g., protesting) behaviors on a sliding scale from 0 (*never*) to 100 (*at every opportunity*). The two-factor structure of these items (individual and collective action) has been verified in previous research (Stanley et al., 2021). Cronbach's alphas indicated that each subscale was reliable: Individual Action ($\alpha = .85$), Collective Action ($\alpha = .90$). We averaged the items to create a composite score for each subscale.

Psychological Distress

Depression, anxiety, and stress were measured using the 21-item short-form version of the Depression Anxiety Stress Scales (DASS-21; Lovibond & Lovibond, 1995). The DASS-21 is a set of three seven-item subscales that can be validly used to assess depression, anxiety, and stress in nonclinical samples (Henry & Crawford, 2005). Participants rated the severity and frequency of 21 symptoms (e.g., "I found it difficult to relax") experienced over the past week from 0 (*did not apply to me at all*) to 3 (*applied to me very much, or most of the time*). The reliability of each subscale was acceptable: Depression ($\alpha = .94$), Anxiety ($\alpha = .89$), Stress ($\alpha = .91$). We summed the items to give a total score for each subscale.

Statistical Analyses

We conducted analyses in R (Version 4.1.0). We first performed scale reliability, descriptive, and correlational analyses using the *psych* package (Revelle, 2018). We then performed path analysis (a type of structural equation modeling) using the *sem()* function in the *lavaan* package (Rosseel, 2012) to evaluate the overall fit of our hypothesized model and to estimate the direct, indirect, and total effects of nature connectedness and climate worry on individual action, collective action, and psychological distress (see Figure 1). We tested the model separately for each indicator of psychological distress (depression, anxiety, stress). Gender and age were included as additional exogenous variables to control for their effects,[2] and the residual variances were allowed to correlate between individual and collective action. We used the weighted least squares mean and variance-adjusted (WLSMV) estimation method because our model included a variable (climate worry) that was measured on an ordinal scale with less than five response categories. WLSMV is specifically designed for categorical variables and is the recommended approach for structural equation models that contain endogenous ordinal data (Li, 2016). Acceptable model fit was evaluated as comparative fit index (CFI) and Tucker-Lewis index (TLI) $> .90$, root mean square error of approximation (RMSEA) $< .08$, and standardized root mean square residual (SRMR) $< .08$ (Kline, 2015).[3] Data and syntax are available on the Open ScienceFramework (Curll et al., 2022).

Results

Descriptive and Correlational Analyses

Descriptive statistics and correlations between model variables are presented in Table 1. As anticipated, we observed moderate positive correlations between nature connectedness, climate worry, and climate action, while nature connectedness and climate worry showed weak positive correlations with each indicator of psychological distress (depression, anxiety, and stress). Contrary to expectations, when looking at simple correlations, individual action was not correlated with

[1] The data set used in this study was part of a larger project assessing climate change attitudes in Australia. Part of this project was to test whether different terminology elicits different responses, so participants were randomly allocated to answer four survey questions using "global warming" or "climate change" (relevant to this study, this only affected our measure of climate worry). As no effects of question wording were found (see Table S3 in the online supplemental materials), and the effect of wording was not the focus of this study, we treated both groups together.

[2] Eleven participants who reported their gender as "other" ($n = 3$) or "prefer not to say" ($n = 8$) were excluded due to binary coding requirements. We also ran the analyses including these participants (0 = male, 1 = nonmale) and found no differences in the results.

[3] Chi-square values were reported but were not used to evaluate model fit due to bias in larger samples (Kline, 2015).

Table 1
Descriptive Statistics and Correlations Between Model Variables

Variable	1	2	3	4	5	6	7	8	9
1. Gender									
2. Age	−.29***								
3. Nature connection	.11***	−.01							
4. Climate worry	.22***	−.28***	.44***						
5. Individual action	.16***	.08***	.50***	.42***					
6. Collective action	.00	−.19***	.40***	.49***	.37***				
7. Depression	.13***	−.25***	.07***	.19***	.01	.20***			
8. Anxiety	.12***	−.31***	.14***	.21***	.03	.29***	.73***		
9. Stress	.18***	−.36***	.10***	.24***	.00	.25***	.80***	.81***	
M	—	47.05	4.71	2.86	62.31	22.32	4.48	3.11	4.80
SD	—	17.50	1.27	0.95	20.34	23.30	5.27	4.20	4.82
Scale range	0 = male, 1 = female	18–89 years	1–7	1–4	0–100	0–100	0–21	0–21	0–21

Note. $N = 3{,}875$. Correlation coefficients are polyserials for gender and climate worry and Pearson's *r* for all other variables.
*** $p < .001$.

psychological distress, and collective action was positively correlated with distress.

Path Model

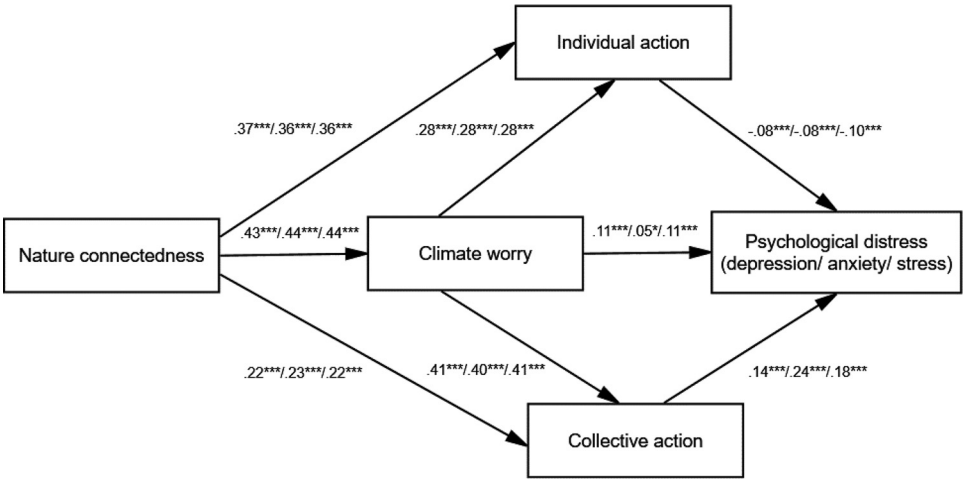
Our hypothesized model fit the data adequately for all three models tested. For the model predicting depression, $\chi^2(1) = .03$, $p = .864$, CFI = 1.00, TLI = 1.00, RMSEA = .00, 90% confidence interval [.00, .02], SRMR < .01; for anxiety, $\chi^2(1) = 18.78$, $p < .001$, CFI = .99, TLI = .92, RMSEA = .07, [.04, .10], SRMR = .01; and for stress, $\chi^2(1) = 2.79$, $p = .095$, CFI = 1.0, TLI = .99, RMSEA = .02, [.00, .05], SRMR < .01. Hence, no modifications to the model were required.[4] We next examined the direction, size, and significance of the estimates for the specific direct, indirect, and total effects. Standardized parameter estimates are presented in Figure 2. Squared multiple correlations and standardized estimates for key direct, indirect, and total effects are presented in Table 2. Additional results, including unstandardized estimates and standard errors and the effects of covariates, are shown in Table S4 in the online supplemental materials.

Results were similar across the three models and supported most of our hypotheses. Standardized total effects indicated that nature connectedness was weakly positively related to depression, anxiety, and stress, supporting Hypothesis 1. We observed significant positive indirect effects whereby nature connectedness was associated with increased climate worry that, in turn, was associated with increased depression, anxiety, and stress, supporting Hypothesis 2. Contrary to the bivariate correlations, when examined in the model, Hypothesis 3 was partially supported. Nature connectedness was directly and indirectly (via climate worry) associated with increased engagement in individual action that, in turn, was associated with lower depression, anxiety, and stress. In contrast to expectations, however, the indirect effects of nature connectedness on distress via increased collective action were significant and positive.

[4] We note the informativeness of the model fit measures is otherwise limited in the current study given that the structural model tested was almost saturated ($df = 1$) and the interpretation of the model fit indices for models using WLSMV is unclear (e.g., Xia & Yang, 2019).

Figure 2

Standardized Parameter Estimates for the Three Models Tested Predicting Depression, Stress, and Anxiety



Note. $N = 3{,}875$. For clarity, demographic variables (gender, age) are not shown (see Table S4 in the online supplemental materials).
* $p < .05$. *** $p < .001$.

Discussion

We present the first evidence on the role of emotional and behavioral responses to climate change in the link between nature connectedness and mental health. In line with our hypothesized model (see Figure 1), we found that nature connectedness was positively related to worry about climate change. Climate worry, in turn, was associated with increased engagement in individual and collective climate action, as well as increased psychological distress. While taking individual action showed the expected association with lower psychological distress, taking collective action was unexpectedly linked to higher distress.

We contribute to recent work exploring the potential negative aspects of connecting with nature in a changing climate (e.g., Chawla, 2020; Larson et al., 2021). In a postbushfire context, we found that individuals with a stronger connection to nature reported higher levels of depression, stress, and anxiety. Though the strengths of these relationships were weak, they mirror Dean et al.'s (2018) findings of a positive association between nature connectedness and psychological distress after a major flood. We extend their findings by showing that the relationship between nature connectedness and psychological distress is indirect through climate worry and engagement in collective climate action. These results reinforce earlier findings that people who feel more connected with nature experience stronger responses to climate change (e.g., Clayton & Karazsia, 2020) and show that this might be associated with negative mental health outcomes. However, the present research was conducted in the aftermath of an extreme weather event, and it is not clear to what extent the results generalize to other contexts. It may be that the positive aspects of a close relationship with nature exceed any negative mental health implications in contexts where climate change is less immediately threatening. To address this issue, future research could test whether the relationships observed in this study vary across geographical and temporal contexts according to their proximity to climate-related events.

Our findings add to existing evidence that those more connected with nature are more likely to take individual and collective climate action (Mackay & Schmitt, 2019; Whitburn et al., 2020). We extend this literature by providing preliminary evidence for the underlying role of climate worry. This finding supports previous claims that worry provides motivational "fuel" for action and, as such, is a

Table 2

Squared Multiple Correlations and Standardized Estimates for Direct, Indirect, and Total Effects

		Effects of nature connectedness							Effects of climate worry			
			Indirect							Indirect		
Outcome	R^2	Direct	Via worry	Via individual action	Via worry then individual action	Via collective action	Via worry then collective action	Total	Direct	Via individual action	Via collective action	Total
Climate worry	.27	.44***						.44***				
Individual action	.32	.36***	.12***					.49***	.28***			.28***
Collective action	.32	.23***	.18***					.41***	.40***			.40***
Depression	.10	—	.05***	−.03***	−.01***	.03***	.03***	.06***	.11***	−.02***	.06***	.14***
Anxiety	.15	—	.02*	−.03***	−.01***	.06***	.04***	.08***	.05*	−.02***	.10***	.12***
Stress	.18	—	.05***	−.04***	−.01***	.04***	.03***	.07***	.11***	−.03***	.07***	.15***

Note. Dashes indicate the parameter was fixed at zero. Blank cells indicate there was no indirect path.
* $p < .05$. *** $p < .001$.

constructive response to climate change (e.g., Bouman et al., 2020; Verplanken et al., 2020). However, climate worry only explained a small proportion of the associations between nature connectedness and climate action, suggesting other factors may be involved. For instance, connecting with nature might promote climate action through an enhanced sense of personal responsibility (Bouman et al., 2020), collective efficacy, and/or collective identity (e.g., Reese et al., 2020). We recommend future studies explore these processes, as well as other theoretically relevant climate emotions, including anger (Stanley et al., 2021) and hope (Schneider et al., 2021).

This research also contributes to the literature on climate worry by showing that it not only predicts individual behavior (Bouman et al., 2020) but also predicts collective action. Indeed, the link with collective action was stronger than with individual action in this study, perhaps reflecting a recognition from people worried about climate change that solving the problem requires cooperation. This is an important finding given the urgent need to find ways to encourage collective climate motivation (Fritsche & Masson, 2021). We note, however, that any messages or interventions targeting climate worry require careful design and evaluation to ensure they do not result in backfire effects (reductions in the desired behavior; Doell et al., 2021) or negative mental health outcomes (Brosch, 2021).

Our conceptual model was based on the idea that taking action to address climate change can benefit individual well-being (Clayton, 2020; Schmitt et al., 2018; Zawadzki et al., 2020). However, our results showed that only individual (not collective) action was associated with reduced psychological distress, suggesting that any protective benefits may be limited to these types of behaviors. Taking personal action to address climate change may protect well-being by providing a sense of meaning (Venhoeven et al., 2020) and generating positive emotions (e.g., pride, hope; Schneider et al., 2021). Recently, there has been increasing attention on the pleasurable feelings associated with pro-environmental action, referred to as "warm glow" (Hartmann et al., 2017; Jia & Linden, 2020). According to this literature, experienced and anticipated warm glow from acting sustainably can contribute to an upward spiral of action and well-being (Doell et al., 2021; Schneider et al., 2021). Future studies could test whether people more connected to nature are more susceptible to the warm glow effect and examine the role of warm glow in preventing

negative climate emotions from turning into general psychological distress.

In contrast to individual action, participating in collective action was associated with higher psychological distress. Unlike most individual behaviors that have a direct and quantifiable impact on an individual's carbon footprint, the environmental impact of collective action is contingent on other people's responses. As such, engaging in collective action may be less likely to elicit a warm glow and provide protection against environmental distress. This interpretation is supported by Zawadzki et al.'s (2020) findings that collective action had a much weaker association with subjective well-being, including warm glow. Moreover, collective action may have a stronger association with negative emotions, such as anger and powerlessness about widespread inaction on climate change and guilt about not doing enough (Godden et al., 2021; Pihkala, 2020). Another possible explanation relates to differences in identity; engaging in individual action is linked to a green personal identity (Whitmarsh & O'Neill, 2010), whereas engaging in collective action is linked to a social identity (e.g., as an "environmentalist"; Schmitt et al., 2019). While a green self-identity has been consistently linked to higher subjective well-being (e.g., Binder et al., 2020), the well-being effects of identifying as an environmentalist may depend on the social context (Godden et al., 2021). It is also possible that the ongoing lack of political responsiveness to climate activism in Australia, combined with COVID-19 restrictions on events such as climate rallies, strengthened the positive association between collective action and psychological distress observed in this study. We want to emphasize, however, that experiencing symptoms of distress does not preclude simultaneous benefits for well-being, such as meaning, belonging, and empowerment (Bamberg et al., 2018; Godden et al., 2021). An important next step for research in this area is to identify why and in what circumstances collective climate action strains well-being.

Practical Implications

Our findings have practical implications for promoting global health in a changing climate. Overall, our results support programs targeting nature connectedness to increase climate change engagement. Of relevance, a recent paper by Richardson and colleagues (2020) presented recommendations for a range of interventions to improve human-nature relations, from the individual to the societal scale. However, our research also highlights a need for researchers and policy makers to consider the potential mental health risks of connecting with nature, especially given that the impacts of climate change are accelerating around the world (Intergovernmental Panel on Climate Change, 2021). For example, interventions targeting nature connectedness may benefit from incorporating strategies to help people manage their emotional responses to climate change.

In this regard, our findings support previous recommendations that taking action to reduce climate change can have cobenefits for personal and global health (e.g., Lawrance et al., 2021). However, our results imply that individual forms of action may be more effective than collective action in protecting individual mental health. From a global health perspective, however, collective action is vital to achieving the systemic change needed to limit global warming and should be encouraged (Intergovernmental Panel on Climate Change, 2021; Masson & Fritsche, 2021). This highlights the importance of providing better psychological support to people engaged in collective climate action, both to protect individual mental health and to ensure sustained participation.

Beyond taking individual action, several opportunities for improving mental health in the climate change context have been identified. First, positive experiences in nature (e.g., bushwalking, gardening, forest bathing) may help individuals process complex climate emotions and prevent burnout and despair (e.g., Driscoll, 2020; Godden et al., 2021). Second, meaning-focused coping, which involves finding hope and purpose in facing the problem and trusting others to develop solutions, has been linked to increased pro-environmental action and better mental health among young people (Ojala, 2012, 2013). One way to promote meaning-focused coping might be to provide safe spaces for people to connect and share their feelings about climate change (Godden et al., 2021; Ojala et al., 2021). Third, fostering collective thinking, for example, through social identification or collective efficacy, may reduce feelings of isolation and personal helplessness and support concerted action against climate change (Bamberg et al., 2018; Masson & Fritsche, 2021).

Limitations and Future Directions

Our study has several limitations that point to additional future research directions. Although we used a large and diverse sample, it was neither a true probability sample nor fully representative of the Australian adult population. Replication with probability sampling is needed to assess the generalizability of our findings. It will also be important for future research to test our model across different countries and among groups that are especially vulnerable to the mental health impacts of climate change, such as young people (Hickman et al., 2021) and Indigenous populations (Cunsolo et al., 2020). Another limitation is the cross-sectional design; experimental and longitudinal studies are needed to confirm the causal nature and direction of the relationships in our proposed model. For example, bidirectional relationships are plausible—witnessing and anticipating the effects of climate change might also affect people's relationship with nature. Future research should also consider additional variables that might impact this model, such as efficacy beliefs (e.g., Gregersen et al., 2021), personal identity (Whitmarsh & O'Neill, 2010), and social identity (e.g., Schmitt et al., 2019). Finally, we used a single-factor measure of nature connectedness. Future research using multidimensional measures (e.g., Nisbet et al., 2009) could help identify the aspects of nature connectedness most relevant to climate action and mental health.

Conclusion

This study contributes to a better understanding of the associations between nature connectedness, pro-environmental behavior, and mental health in the climate change context. Overall, our results provide preliminary support for a process by which a sense of connectedness to nature stimulates worry about climate change that, in turn, is linked to greater behavioral engagement. Perhaps most importantly, we show that taking individual versus collective action might have opposing associations with individual mental health. Given the importance of collective action for tackling climate change, providing better mental health support to activists should be a research and public policy priority.

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