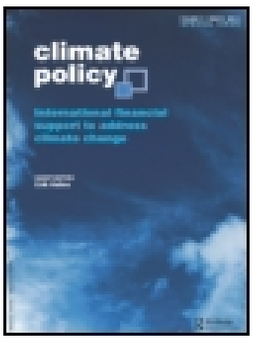

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The resilience paradox: flooding experience, coping and climate change mitigation intentions

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ABSTRACT

Climate change is projected to increase the frequency, intensity and unpredictability of extreme weather events across the globe and these events are likely to have significant mental health implications. The mental health literature broadly characterises negative emotional reactions to extreme weather experiences as undesirable impacts on wellbeing. Yet, other research in psychology suggests that negative emotional responses to extreme weather are an important motivation for personal action on climate change. This article addresses the intersection of mental health and functional perspectives on negative emotions, with a specific focus on the potential that reduced negative emotional responses to extreme weather may also translate to diminished motivation to undertake climate change mitigation actions – which we term the 'resilience paradox'. Using survey data gathered in the aftermath of severe flooding across the UK in winter 2013/2014, we present new evidence indicating that self-appraised coping ability moderates the link between flooding experience and negative emotions and thereby attenuates the indirect link between flooding experience and climate change mitigation intentions. We conclude that support for flood victims should extend beyond addressing emotional, physical and financial stresses to include acknowledgement of the involvement of climate change and communication of the need for action to combat future climate risks.

Key policy insights

- Psychological resilience to flooding and other extreme weather events can translate to diminished motivation to mitigate climate change
- Negative emotional reactions need to occur at an optimal level to enable people to respond appropriately to climate risks.
- Flood victims' subjective appraisal of their ability to cope does not necessarily encompass consideration of the role played by climate change. Therefore, support for victims of extreme weather should include explicit acknowledgement of the involvement of climate change and the need for action to mitigate future climate risks.

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Climate change; extreme weather; flooding; risk; resilience

1. Introduction

This article tackles a paradox in building resilience to the psychological or mental health impacts of extreme weather and climate change. Whereas negative emotional consequences are a direct and troubling consequence of climate change (Berry, Waite, Dear, Capon, & Murray, 2018; Cunsolo & Ellis, 2018), there is also

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accumulating evidence that some of these same reactions may play key roles in motivating individuals to undertake mitigation responses (Demski, Capstick, Pidgeon, Sposato, & Spence, 2017; Spence, Poortinga, Butler, & Pidgeon, 2011). The present analysis examines how resilience to plausible climate change impacts, specifically extreme weather, is likely to affect people's drive to mitigate climate change. Using individuals' subjective appraisal of their ability to cope with a severe flooding event in the UK in the winter of 2013/2014 as an index of resilience, we aimed to determine if resilience affects the process through which extreme weather experiences foster climate change mitigation intentions. Our wider concern in doing so is to question whether personal capacity to cope with climate impacts might have the subsidiary effect of dampening people's willingness to limit their own contribution to climate change – which we describe here as a 'resilience paradox'.

1.1. The mental health impacts of extreme weather and climate change

Extreme weather events are expected to increase in frequency, intensity and unpredictability due to climate change (Seneviratne et al., 2012). These events are likely to have negative mental health implications through economic, social and environmental disruptions, and through the psychological distress and anxiety that may come with acknowledging climate change as a global environmental threat (Cunsolo & Ellis, 2018; Fritze, Blashki, Burke, & Wiseman, 2008). Different mental health impacts can result from extreme weather experience depending on the scale, suddenness, and cultural and historical contexts of the catastrophe (Fritze et al., 2008). This article focuses on flooding, an extreme weather event occurring around the world which will be exacerbated in many places by climate change (Hirabayashi et al., 2013).

Among communities exposed to flooding, people affected by floodwater in their homes have been shown to exhibit a greater prevalence of psychological distress and mental ill-health symptoms than those not affected (Jermacane et al., 2018; Mason, Andrews, & Upton, 2010; Paranjothy et al., 2011). Physical and financial impacts resulting from flooding are associated with the risk of negative mental health outcomes (Paranjothy et al., 2011), while relocation during flood recovery is the strongest predictor of long-term mental health deterioration (Lamond, Joseph, & Proverbs, 2015). Prior reports by Fernandez et al. (2015) and Johal and Mounsey (2016) provide detailed systematic reviews of research on the mental health effects of flooding.

In spite of a growing focus on the health impacts of climate change, researchers argue that mental health remains largely neglected (Berry et al., 2018; Gifford & Gifford, 2016). For many people, the mental health impacts of extreme weather can be more serious and more persistent than physical health impacts (Carroll, Morbey, Balogh, & Araoz, 2009). Gifford and Gifford (2016) indicate that psychological vulnerability to climate change impacts is determined by the resilience of individuals and their communities. On this basis, they suggest that climate change (and extreme weather) should be viewed as a challenge to be met with social engagement, pro-environmental action and attitudes that serve to buffer its negative impact.

1.2. Resilience to extreme weather and climate change risks: conceptualisation and critiques

Resilience is a recurrent theme in research and policies aimed at helping people deal with the impacts of extreme weather (Keim, 2008; Lopez-Marrero & Tschakert, 2011; Ntontis, Drury, Amlôt, Rubin, & Williams, 2018a) and is associated with the capacity to adapt to climate change (Nelson, Adger, & Brown, 2007). At the community level, resilience is described as encompassing the static resources that buffer a community's vulnerability and the agentic characteristics of community members and whole communities that enable adaptive preparation, responses and growth in the face of harmful events (Chapman, Trott, Silka, Lickel, & Clayton, 2018). At the individual level, psychological resilience to extreme weather is commonly discussed in terms of coping with adverse impacts and recovering from psychological distress (Greene, Paranjothy, & Palmer, 2015; Johannesson, Lundin, Fröjd, Hultman, & Michel, 2011; Lee, Ce Shen, & Tran, 2009). Ebi (2011) argues that resilient people anticipate risks, reduce vulnerability to those risks, respond effectively to threats and recover faster with increased capacity to respond to the next threat. Conceptualisations of resilience at the community and individual level are intuitively interconnected and mutually encompassing, but individuals are more commonly the unit of analysis in psychological resilience research. The theme of this article is, in part, linked to the balance of individual and collective outcomes in the operationalisation of psychological resilience.

The emphasis placed on resilience in policy responses to societal risks has been the subject of extensive criticism. Diprose (2014) argues that a focus on resilience encourages people to live with insecurity and undermines the collective struggle for social change. In her view, the climate change adaptation discourse is dominated by discovering how storms are to be withstood because adversity is presumed to be inevitable. Moreover, she observes that resilience narratives relocate responsibility for risk management and wellbeing disproportionately by targeting the character of individuals and communities, while those who manufacture and profit from crises are exonerated. These points lead to a conclusion that resilience is more likely to instil inequalities and form habits of resignation than foster genuine societal transformation (Diprose, 2014). Similarly, Furedi (2008) argues that a rhetoric of building resilience frequently gives way to an emphasis on vulnerability; casting vulnerability as the defining condition of social life and cultivating a sense of powerlessness as part of a normal state of being. People's inherent resilience is often ignored or treated as an exception to the rule within considerations of their vulnerability, while their assumed inability to effectively deal with adversity is over-emphasised (Ntontis et al., 2018a). Yet, resilience does not imply an absence of vulnerability (Bonanno, 2004). Rather, temporary distress or disorder is a normal response to adversity and trauma, and the concept of resilience needs to encompass acceptance that such responses are not reflective of a lack of resilience (Ntontis et al., 2018a).

1.3. A functional view of negative emotional reactions to extreme weather

Negative emotional reactions to extreme weather are primarily discussed in terms of psychopathology and compromised wellbeing in the mental health literature (Fernandez et al., 2015; Mason et al., 2010) but the functional nature of these responses are emphasized in other areas of psychology. In this respect, anxiety and distress are conceptualised as components of a suite of psychological processes that determine how people respond to risks and stressors (Pfister & Böhm, 2008; Reser & Swim, 2011). Flooding and other extreme events offer concrete accessible representations of the plausible risks posed by a changing climate, and thereby possess significant potential to shape perceptions and behavioural responses (Reser, Bradley, & Ellul, 2014; Weber, 2016). In other words, extreme weather experiences can help anchor seemingly abstract and distant climate change impacts in the 'here and now' (Brody, Zahran, Vedlitz, & Grover, 2008; Reser et al., 2014) by rooting appraisals of climate change risk in proximate and emotionally resonant impacts.

Negative emotional responses to extreme weather may steer the selection of behaviours to pursue or avoid anticipated emotional outcomes; they may also promote learning by informing cognition and behavioural choice (Baumeister, Vohs, Nathan DeWall, & Liqing Zhang, 2007). For example, Lamond et al. (2015) observed that flooded households that took action to prevent future flood damage after a major flooding event across England in 2007 also reported lower levels of mental health deterioration. They interpreted this as an indication of experiential learning enhanced by a motivation to avoid future stress and anxiety. Demski et al. (2017) also showed that flooding experience is indirectly linked to intentions to engage in climate change mitigation behaviours via negative emotional responses to flooding. Where extreme weather impacts are taken to represent the threat posed by climate change to 'objects of care' such as the home, treasured local places, or the planet at large, strong emotional responses can motivate caring about climate change, which in turn predicts pro-environmental behaviour and support for climate change policies (Wang, Leviston, Hurlstone, Lawrence, & Walker, 2018). Yet, it is important to acknowledge that negative emotional responses to environmental problems can also be unconstructive, particularly when they are accompanied by a sense of powerlessness or lack of control over unfolding change. This is exemplified by *solastalgia*, a form of severe distress experienced when people are affected by adverse environmental change in their home environment (Albrecht et al., 2007). According to Askland and Bunn (2018), solastalgia is an ontological trauma; a rupture of the fabrics of place, belonging and social relations that disrupts the ongoing sense of being associated with home.

1.4. Uncovering a paradox at the intersection of mental health and functional perspectives on emotional responses to extreme weather: emotion- versus problem-focused coping

The mental health literature broadly characterises negative emotional responses to extreme weather events, especially anxiety and distress, as undesirable psychological impacts to be minimised by building resilience

(e.g. Greene et al., 2015), while from a functional perspective these same emotions are considered potential motivators of action on climate change (e.g. Demski et al., 2017). This article focuses on the intersection of these two perspectives and identifies a 'resilience paradox', which refers to the likelihood that reduced negative emotional reactions to extreme weather may also mean diminished motivation to address climate change.

Psychological resilience is defined by the success of the coping processes people employ to deal with challenging circumstances (Leipold & Greve, 2009). Coping involves cognitive and behavioural efforts to manage external and/or internal demands that are appraised as taxing or exceeding personal resources (Lazarus & Folkman, 1984). These efforts may centre on resolving an identified risk (*problem-focused coping*; such as attempts to reduce flood risk to one's home) or managing the emotions associated with the risk (*emotion-focused coping*; such as attempts to reduce or avoid negative emotions) (Folkman & Lazarus, 1980). Psychological resilience also reflects positive adaptation to adversity (Fletcher & Sarkar, 2013) and optimal indicators of resilience are those considered to be most conceptually relevant to the risk encountered (Luthar & Cicchetti, 2000). Often, the absence of negative emotional responses in individuals exposed to extreme weather is considered an indication of psychological resilience in the mental health literature (Bei et al., 2013; Greene et al., 2015; Lee et al., 2009), with no explicit distinction made between the functional and psychopathological implications of negative emotions. This broad problematisation of negative emotions sets the stage for a paradox in the common concept of psychological resilience to extreme weather. It should be noted that although coping includes emotion regulation, coping also includes actions taken to achieve non-emotional goals (see Gross, 1998). By extension, this implies that psychological resilience involves more than simply regulating negative emotions.

When individuals are faced with a hazard or threat, psychological processes are triggered including affective arousal (i.e. the experience of negative emotional states such as fear, anxiety, distress) and cognitive appraisals (evaluations of threat severity, susceptibility to the threat, and the potential effectiveness of available threat mitigation responses). Hazards that trigger strong emotional responses are most likely to elicit an active response (Weber, 2006). Negative emotions heighten attentional focus on hazard/threat-relevant information, and favourable cognitive appraisals (*i.e.* high perceived threat severity, susceptibility and response effectiveness) determine individuals' propensity for actions aimed at resolving the threat (problem-focused coping) (Finucane, 2012; Rogers, 1975). However, threat mitigating action is unlikely to occur if negative emotions can be managed by other means such as avoiding or positively reappraising the threat (emotion-focused coping) (Folkman & Lazarus, 1980; Witte, 1994). It is important to note that problem- versus emotion-focused coping is a shifting, rather than static, process that occurs along a continuum. Nonetheless, problem-focused coping is only possible where appropriate problem-solving competence is available, while emotion-focused coping is favoured when a problem is seen as something to be accepted or where there is a motive to downplay its implications (Folkman & Lazarus, 1980; Leipold & Greve, 2009).

Based on these considerations, we propose that if psychological resilience to extreme weather is conceived of in the narrow sense of reduced negative emotional responses, this may be at odds with the goal of climate change mitigation because it implies a reduction of the emotion-driven motivation to undertake mitigation actions. A view of resilience that is limited to emotion rather than problem-focused coping risks excluding actions relevant to tackling climate change as a driver of extreme weather. To substantiate our thesis, we examined responses to flooding and climate change in the UK for evidence of a psychological resilience paradox. Using data gathered in the wake of severe flooding across the country in the winter of 2013/2014, we explored the interaction between flooding experience and coping in predicting negative emotional reactions to flooding (anxiety and distress) and intentions to mitigate climate change. Here coping is used as an index of resilience to the flooding event. Further, we conceive of the resilience paradox as a trend in which the indirect influence of flooding experience on climate change mitigation intentions (that is itself mediated by negative emotions) weakens as a function of increasing coping ability.

2. Method

2.1. Data

The data were gathered by researchers at Cardiff University and the University of Nottingham in Autumn 2014 (Pidgeon, Demski, Capstick, Spence, & Sposato, 2016). Computer Assisted Personal Interviews (CAPI) were

conducted with a nationally-representative British sample ($N = 1{,}002$) and an additional booster-sample of residents in five flood-affected areas ($N = 995$) between 28 August and 31 October 2014. Details of the sampling procedures and questionnaire have been presented in previously published reports (Capstick et al., 2015; Demski et al., 2017). The dataset is available within the UK Data Service catalogue.

2.2. Sample characteristics and operationalisation of flooding experience

Only individuals who indicated that they had been personally affected a little ($N = 536$), a fair amount ($N = 202$) or a great deal ($N = 83$) by the 2013/2014 UK winter flooding, as opposed to not at all, were included in the analyses (total $N = 821$). Five indices of flooding experience were assessed in the survey including property damage ($N_{affected} = 153$ [18.7%]), disruption of travel ($N_{affected} = 549$ [66.9%]), disruption of essential services such as gas, electricity, water supply etc. ($N_{affected} = 242$ [29.5%]), experience of property damage by other people in respondents' local area ($N_{affected} = 526$ [64.1%]) and experience of property damage or disruption by respondents' friends and family ($N_{affected} = 461$ [56.1%]) due to the flooding. However, to enable direct comparisons with previous reports regarding the 2013/2014 UK winter flooding (e.g. Capstick et al., 2015; Demski et al., 2017), we operationalised flooding experience as the contrast between individuals with direct experience of property damage ($N = 153$) and those with other less direct or less impactful experiences with the 2013/2014 UK winter flooding ($N = 668$).

Direct flooding experience was measured as objectively as possible by articulating exactly what direct experience of flooding entailed (for further details see Demski et al., 2017; Capstick et al., 2015 and note 2). We also ensured that climate change perceptions and behavioural intentions items were presented at the start of the survey, and flooding experience items towards the end, to preclude the risk that questions to participants about flooding could influence their other responses. Despite the cross-sectional design of the survey, these procedures enable us to have confidence in our assumptions of causality. A demographic profile of the sample is presented in Appendix 1 (Supplementary Data).

2.3. Data analysis

Measures of direct flooding experience, subjective coping appraisal, negative emotional responses to the flooding, and intentions to engage in climate change mitigation behaviour were derived from the dataset (Table 1). The measure of negative emotions was constituted from an average of respondents' rating of the levels of anxiety and distress experienced when thinking about the flooding. Climate change mitigation intentions were assessed with an average of the reported likelihood of undertaking six climate change-related pro-environmental actions. The PROCESS macro for regression-based estimation of mediation, moderation and conditional processes was used to test the interaction between flooding experience and coping appraisal in predicting negative emotions and climate change mitigation intentions (Model 7: Hayes, 2014). Based on indications that political affiliation[1] and a conscious subjective attribution of extreme weather events to climate change may modulate the link between extreme weather experiences and climate change attitudes (McCright, Dunlap, & Xiao, 2014; Ogunbode, Liu, & Tausch, 2017), we controlled for these variables in our analyses. We also controlled for gender, age and social grade[2] to ensure that any effects observed were not due to their influence. Zero-order intercorrelations among the variables are presented in Appendix 2 (Supplementary Data).

3. Results

We constructed a moderation model using ordinary least squares path analysis to examine whether subjective coping appraisal moderated the relationship between direct flooding experience and negative emotional reactions to flooding (Table 2). We found that people who experienced flood damage to their property reported a significantly greater level of negative emotions (M = 4.68, SD = 2.61) than those who had other forms of experience with the flooding (M = 3.85, SD = 2.10; B = 0.92, SE = 0.23, $p < .001$). In addition, self-appraised ability to cope with the flooding was related to significantly lower negative emotions reported (B = −0.96, SE = 0.14, $p < .001$). Moreover, as predicted, there was a significant interaction between direct flooding experience and

Table 1. Measures and items.

Construct	Items	M (SD)	α
Direct experience of 2013/2014 winter flooding			
(0 = No, 1 = Yes)			
	Was your current or previous property affected by the floods between November 2013 and February 2014?[a]	%Yes = 18.7	
Subjective coping appraisal			
(1 = not at all well, 4 = very well)			
	At the time the floods were occurring, how well do you feel you were able to cope with the impacts of the flooding?	3.24 (0.71)	
Negative emotional responses to 2013/2014 flooding			.79
(1 = not felt this at all, 10 = have felt this extremely)			
	When you think about the floods how strongly, if at all, have you felt each of the following emotions?		
	Anxiety	3.85 (2.78)	
	Distress	3.75 (2.69)	
Mitigation behavioural intentions			.73
(1 = very unlikely, 5 = very likely)			
	Change to a 'green' energy supplier which would reduce the impact on the environment from the electricity you use in your home	3.45 (1.16)	
	Cut down the amount you travel by car	3.09 (1.32)	
	Buy appliances that are more energy-efficient	4.27 (0.87)	
	Reduce the amount of energy you use at home	4.11 (0.92)	
	Write letters, email, or phone your local MP about climate change	2.11 (1.19)	
	Sign a petition about climate change, either online or in person	3.44 (1.28)	
Subjective attribution of 2013/2014 flooding to climate change			.81
(1 = strongly disagree, 5 = strongly agree)			
	The floods were caused in part by climate change	3.66 (0.93)	
	The floods were a sign that the impacts of climate change are happening now	3.72 (1.01)	
	The floods showed us what we can expect from climate change in the future	3.81 (0.93)	

[a]This question was further clarified using the following wording: 'This could include any land surrounding your home such as a garden or drive. If you live in a flat, it might include communal areas such as a car park or hallway. Please also answer yes if you stopped the water from flooding your property by using some form of flood defence such as sand bags or a flood gate.'

coping appraisal in predicting negative emotions (B = −0.79, SE = 0.34 $p = 0.021$) (see Figure 1 illustrates the nature of the interaction; Figure 2). This interaction was probed using the pick-a-point and Johnson-Neyman techniques (Hayes & Matthes, 2009).

The pick-a-point technique involves picking representative values of a theorised moderator (typically: 'low' = Mean – 1SD, 'moderate' = Mean, 'high' = Mean + 1SD) and estimating the effect of the independent variable on the dependent variable at these values. Using this technique, direct flooding experience was shown to be significantly related to negative emotional responses at low (B = 1.49, SE = 0.32, $p < 0.001$) and moderate (B = 0.92, SE = 0.23, $p < 0.001$), but not high[3] (B = 0.37, SE = .36, $p = 0.302$) levels of subjective coping appraisal. These

Table 2. Multiple regression and test of moderated mediation.

	Negative emotional responses to flooding			Mitigation intentions		
Predictor	B	SE	Sig.	B	SE	Sig.
Flooding experience	0.92	(0.23)	***	−0.05	(0.07)	
Negative emotional responses to flooding				0.04	(0.01)	**
Subjective coping appraisal	−0.96	(0.14)	***	−0.05	(0.04)	
Flooding experience*Subjective coping appraisal	−0.79	(0.34)	*			
Subjective attribution	0.49	(0.11)	***	0.28	(0.03)	***
Right-leaning voter	0.24	(0.20)		−0.36	(0.06)	***
Gender (Female)	0.47	(0.17)	**	−0.02	(0.05)	
Age	0.15	(0.05)	**	0.00	(0.01)	
Social grade	0.16	(0.08)	*	−0.09	(0.03)	***
F	20.96***	26.22***				
R^2	0.21	0.20				
N	737	737				

Notes: Cell entries are unstandardised regression estimates with standard errors in parentheses.
*$p < .05$; **$p < .01$; ***$p < .001$.

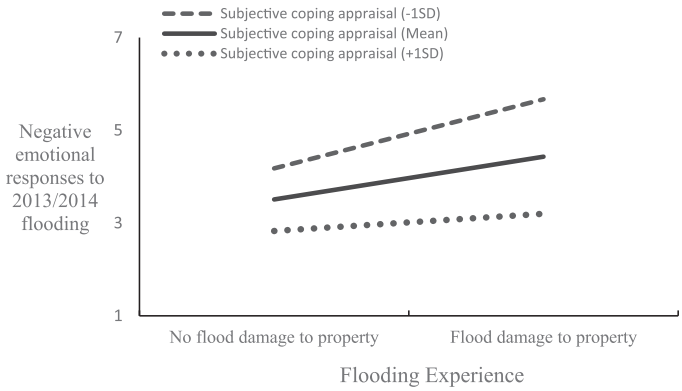

Figure 1. Interaction effects of flooding experience and subjective coping appraisal on negative emotional responses to 2013/2014 UK winter flooding.

observations are in line with an expectation that negative emotional reactions to extreme weather events decline with increased coping capacity or resilience. The Johnson-Neyman technique was used to determine the range of subjective coping appraisal values at which flooding experience was significantly associated with negative emotional responses. This showed that flooding experience positively predicted negative emotional responses among participants with scores less than or equal to 3.77 on the subjective coping appraisal measure (BJN = .57, SE = .29, $p = .050$). Above this value, direct flooding experience did not significantly predict negative emotional responses. 42.3% of individuals in the sample had coping appraisal scores above this value, for which direct flooding experience did not significantly predict negative emotional responses.

We further examined whether negative emotions acted as a mediator between direct flooding experience and mitigation intentions, with the relationship between direct flooding experience and negative emotions again moderated by coping appraisal. We found that negative emotions mediated an indirect positive relationship between direct flooding experience and climate change mitigation intentions, at low (B = 0.06, SE = 0.02, $p = 0.009$) and moderate (B = 0.04, SE = 0.01, $p = 0.015$), but not high (B = 0.01, SE = 0.01, $p = 0.386$) levels of subjective coping appraisal (Table 3).[4] This demonstrates that direct flooding experience was less likely to translate into intentions to undertake climate change mitigation behaviour among individuals with greater self-assessed ability to cope with the flooding.

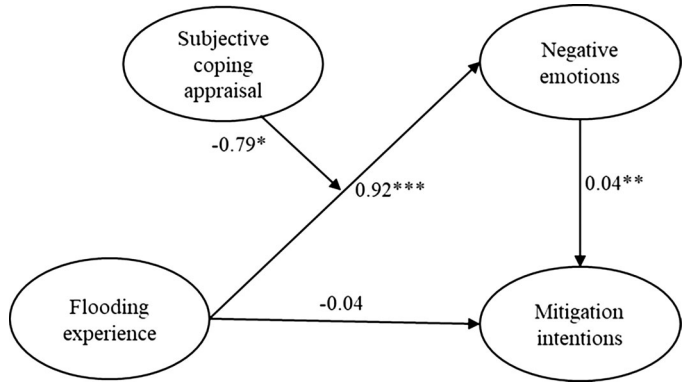

Figure 2. Path model of the relationship between flooding experience and climate change mitigation intentions. The relationship between flooding experience and climate change mitigation intentions is mediated by negative emotional reactions to the flooding event and the relationship between flooding experience and negative emotions is moderated by subjective coping appraisal. Higher subjective coping appraisal of the flooding experience reduces the relationship between flooding experience and negative emotions and the indirect relationship between flooding experience and mitigation intentions. Betas are unstandardized coefficients. $^{**}p < .01$, $^{***}p < .001$. Subjective attribution of the flooding event to climate change, right-leaning voting intentions, age, gender and social grade are controlled.

Table 3. Conditional indirect effects of flooding experience on climate change mitigation intentions via emotional responses to flooding at levels of subjective coping appraisal Mean and Mean ± 1SD.

	Subjective coping appraisal	B(SE)	95% CI
Negative emotional responses to flooding	−1SD	0.06 (0.02)	0.022, 0.098
	Mean	0.04 (0.01)	0.012, 0.066
	+1SD	0.01 (0.02)	−0.010, 0.051
Index of moderated mediation		−0.03 (0.02)	−0.065, −0.002

Note: $N = 737$. The index of moderated mediation represents the slope of the line relating an indirect effect to values of a moderator (Hayes, 2015). 95% confidence intervals are bias-corrected and based on 1,000 resamples (Preacher & Hayes, 2008).

In addition to the main findings, the analyses showed that subjective attribution of the 2013/2014 flooding to climate change positively predicted negative emotional responses to the flooding (Table 2). Females, older respondents and individuals with a higher social grade also reported greater levels of negative emotional responses to the flooding. Further, subjective attribution of the flooding to climate change positively predicted climate change mitigation intentions while right-leaning voting intentions and social grade were negatively related to mitigation intentions.

4. Discussion

Our main finding is that people with a strong ability to cope with flooding are unlikely to experience a level of negative emotions that, in other cases, might prompt personal action to mitigate climate change. Our data show that, among individuals with high self-appraised ability to cope with flooding, direct flooding experience was unrelated to negative emotions, and negative emotions did not mediate an indirect link between direct flooding experience and climate change mitigation intentions. However, at low and moderate levels of subjective coping appraisal, direct flooding experience predicted negative emotions and negative emotions mediated an indirect relationship between direct flooding experience and climate change mitigation intentions. These observations are consistent with the idea of a psychological resilience paradox whereby the reduction in negative emotional responses arising from an increased capacity to cope with extreme weather may also be associated with diminished motivation to mitigate climate change. Given a plausible causal or exacerbating role of anthropogenic climate change in the growing frequency of flooding and other extreme weather events (Schaller et al., 2016; van Aalst, 2006), characterising negative emotional responses to extreme weather as undesirable psychological impacts may misrepresent an important motivation for problem-focused engagement with climate risks.

4.1. Implications

It has been suggested that reframing the stresses experienced by flood victims towards acceptance of the uncontrollable and unchangeable is an effective coping strategy for protecting against disaster-related mental health impacts (Bei et al., 2013). Indeed, emotion-focused coping has been linked with reduced stress regarding largely uncontrollable technological and environmental disasters (e.g. Baum, Fleming, & Singer, 1983). However, in the context of extreme weather, emotion-focused coping may detract from people's resources for tackling future risks and impede problem-focused engagement with the broader challenge of climate change. Some scholars argue that anxiety and distress need to be activated at an optimal level in order for people to respond appropriately to climate risks (Reser, Morrissey, & Ellul, 2011; Weber, 2006). This does not mean that mental health must be sacrificed for people to act on climate change, or that emotion-focused coping is invariably antithetical to an adaptive response to climate change-induced extreme weather. Indeed, acute negative emotions can undermine individuals' ability to engage in meaningful climate action and a degree of emotion-focused coping may be necessary to translate these emotions into constructive behavioural outcomes (Lertzman, 2015). Our data highlight the need for more discerning analyses of the roles played by anxiety and distress in public engagement with climate risks.

The paradox of a resilience concept that indiscriminately characterises negative emotions as indicators of compromised wellbeing or mental ill-health underscores the need to explicitly distinguish psychopathological

or maladaptive emotions from negative emotions that foster active engagement with climate risks. A pragmatic conceptualisation of psychological resilience to climatic adversity must balance acceptance of the distressing nature of climate change impacts with constructive engagement with climate risks. Negative emotions regarding climate change impacts are linked with mitigation motivation, a sense of efficacy and broad support for policy action (Hornsey & Fielding, 2016; Smith & Leiserowitz, 2014). Efficacy beliefs, in turn, facilitate adaptive responses to climatic adversity and provide a buffer against psychopathological emotions (Benight & Bandura, 2004; Thaker, Maibach, Leiserowitz, Zhao, & Howe, 2016; Ursano et al., 2014). These functional benefits of negative emotional responses need to be clearly acknowledged in the increasingly popular mental health framing of climate change.

The moderating role of subjective coping appraisal in the indirect link between flooding experience and climate change mitigation intentions can also be interpreted in terms of the social dilemma posed by climate issues. Shepard, Boudet, Zanocco, Cramer, and Tilt (2018) report that resilience-building and adaptation took priority over climate change mitigation in the aftermath of severe flooding in Boulder, Colorado. The focus on resilience amplified divisions within flood-affected communities through imbalances in the availability of resources and social capital to high- and low-income residents. This illustrates Diprose's (2014) observation that emphasizing resilience can undermine the collective capacity to achieve equitable long-term solutions to social problems. Although self-appraised coping ability did not directly predict mitigation intentions in our data, negative emotions were attenuated with increased coping (a personal benefit) and this trend was associated with reduced climate change mitigation intentions (a collective disadvantage).

It is important to note that a focus on resilience-building does not inherently preclude mitigation action, especially when approached from the perspective of achieving community resilience (Chapman et al., 2018). We propose that conflicting individual and collective interests can be reconciled when people are psychologically attuned to collective resources for responding adaptively to extreme weather, as well as the broader aims of climate change mitigation. For instance, perceived social cohesion has been linked to disaster preparedness and reduced psychological harm from flooding (Greene et al., 2015; Lo & Chan, 2017; Walker-Springett, Butler, & Adger, 2017). Flood events provide an opportunity to strengthen and forge new community connections (Walker-Springett et al., 2017). Shared experiences of such adversity can enhance motivation for pro-social behaviour via increased empathy and identification with fellow victims (Vollhardt, 2009). Drawing from research in social psychology (Ntontis, Drury, Amlôt, Rubin, & Williams, 2018b; Rimé, 2007), it is likely that negative emotional responses among communities with shared extreme weather experiences can foster social cohesion, solidarity and a collective identity that promotes wellbeing and empowers people to respond more effectively to climatic impacts.

4.2. Limitations and future directions

The cross-sectional design of our study precludes definitive conclusions on the causal relationships between flooding experience, coping, emotions and climate change mitigation intentions, although the study design used (paying particular attention to ordering effects) enables us to have some confidence in this regard. Nevertheless, further investigation of the psychological resilience paradox with experimental and longitudinal approaches would be beneficial. It is also necessary to verify the theorised distinction between subjective coping appraisal and negative emotions. Could it be that people with low self-appraised coping ability were also those who were more emotionally affected by the flooding? Subjective coping appraisal and negative emotions were only modestly correlated in our data which suggests a distinction between the two factors (Appendix 2 – supplementary data). Coping is associated with a range of outcomes including negative emotions but coping and emotions have a bi-directional relationship and any theoretical formulation emphasizing a uni-directional influence of either factor is incomplete (Folkman & Lazarus, 1988). Irrespective of these limitations, our data suggest that climate change mitigation intentions are directly linked to negative emotions that are commonly regarded as undesirable mental health impacts or negative indicators of psychological resilience.

We only addressed negative emotions that are commonly framed as pathological or maladaptive in the mental health literature and that have been investigated extensively in the context of stressful and traumatic

experiences. Other emotions such as moral outrage, anger and guilt have also been identified as important predictors of climate action (e.g. Rees & Bamberg, 2014), and understanding how these emotions figure in the link between extreme weather experiences and behavioural responses to climate change would be a worthwhile direction for future research. Additionally, we did not address the extent to which people affected by the 2013/2014 flooding considered the climate change mitigation behaviours to be relevant to flood risk. Among those who attributed the flooding to climate change, we might expect that there would be a recognition that actions taken to reduce climate change also have implications for reducing flood risk. Indeed, we found that subjective attribution of the flooding to climate change was positively linked to climate change mitigation intentions. Nonetheless, in subsequent research, it is necessary to assess the extent to which climate change mitigation actions are considered effective in limiting flood risk and how such perceptions influence the link between flooding experience and climate change mitigation intentions.

5. Conclusion

The links between extreme weather experiences and climate change attitudes are typically modest, complex and indirect (Konisky, Hughes, & Kaylor, 2016; Reser et al., 2014), but these experiences provide a potentially powerful overarching narrative for engaging the public with increasing climate change risks (Wallace, 2012). This article presents cross-sectional evidence suggesting that coping with flooding in ways that simply reduce negative emotional responses may diminish the motivational influence of flooding experiences on climate change mitigation intentions. The contradictory potential mechanisms acting on mitigation intentions arising from flooding experiences are conceptualised here as the resilience paradox. Whilst support for people experiencing extreme weather impacts is essential, we need to make sure that support extends beyond addressing emotional, physical and financial stresses to include acknowledgment of the involvement of climate change and clear communication of the need for action to combat future climate risks. Flooding impacts are symptomatic of the wider global issue of climate change and we should not hide important signals that climate change is having harmful consequences as it could dampen mitigation efforts.

Notes

1. Participants who indicated an intention to vote for the 'British National Party (BNP)', 'Conservatives' or the 'UK Independence Party (UKIP)' in a hypothetical general election were categorised as right-leaning voters.
2. Social grade is a system of demographic classification in the UK, based on a person's occupation. It has been widely used to account for health outcomes and disparities (e.g., Chandola, 2000).
3. Mean + 1SD value for subjective coping appraisal was greater than the maximum observed value. Values reported here are effects of flooding experience on negative emotional responses at maximum observed value of subjective coping appraisal (4).
4. We conducted pairwise contrasts to verify that the estimated indirect effects of flooding experience on climate change mitigation intentions mediated by negative emotions significantly differed across the three levels of coping appraisal (Low coping vs Moderate coping: Contrast = −0.02, SE = 0.01, 95%CI = [−0.043, −0.002]; Low coping vs High coping: Contrast = −0.04, SE = 0.02, 95%CI = [−0.086, −0.004]; Moderate coping vs High coping: Contrast = −0.02, SE = 0.01, 95%CI = [−0.043, −0.002]). Standard errors and 95% confidence intervals for the pairwise contrasts were estimated with 1,000 bootstrap resamples.

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