

Anger and Sadness: Gendered Emotional Responses to Climate Threats in Four Island Nations

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**Margaret du Bray¹, Amber Wutich¹,
Kelli L. Larson¹, Dave D. White¹,
and Alexandra Brewis¹**

Abstract

Climate change presents an important threat to community livelihoods and well-being around the world. Biophysical vulnerability to the effects of climate change, such as sea level rise, coastal erosion, changing flora and fauna, and changing precipitation patterns are predicted to affect island nations in particular. Emotional geographies offers a theoretical entry point to understand how changing landscapes, which are often imbued with emotion and personal significance, may result in heightened emotional states and result in different outcomes depending on the severity of these changes and the biophysical vulnerability that produces them. Historically, emotion and gender have been closely linked; we use biophysical vulnerability to climate change, along with emotion and gender, to argue for a differentiated perspective on how men and women in different places may experience different emotional responses to climate change. Using a cross-cultural analysis of qualitative data from four island countries (Fiji, Cyprus, New Zealand, and the United Kingdom; total $N = 272$), this article explores how different sensitivities to climate change may produce differentiated emotional

¹Arizona State University, Tempe, AZ, USA

Corresponding Author:

Margaret du Bray, School of Human Evolution and Social Change, Arizona State University,
900 Cady Mall, Tempe, AZ 85281, USA.
Email: dubrmarg@asu.edu

responses among men versus women across these four sites. Our results indicate that gender does affect the emotional response of respondents in these sites, but that local sensitivity plays an important role in differentiating these emotional responses, and their causes, between the four sites.

Keywords

climate change, gender, emotion, island nations

Introduction

Although the effects of climate change may not yet be directly felt in most places (Akerlof, Maibach, Fitzgerald, Cedenó, & Neuman, 2013), the threat and discourse of climate change and its possible futures is nevertheless recognized in most places (Intergovernmental Panel on Climate Change [IPCC], 2013). Understanding how people are reacting to current threats and future possibilities is necessary to explore how, as the effects of climate change worsen, different groups of people will respond and react to these changes. Because gender is one of the features that shapes the way people experience the world, gender is also a key variable in understanding how climate change affects different groups. To understand how gender and sensitivity to climate change intersect, it is important to examine how men and women who live in the same place, and are exposed to similar uncertainties and effects of climate change, react to these effects. In climatically vulnerable places, there may be debates about the degree of concern that climate change warrants (Franzen & Vogl, 2013; Hagen, Middel, & Pijawka, 2016; T. M. Lee, Markowitz, Howe, Ko, & Leiserowitz, 2015; Lujala, Lein, & Rød, 2015; Wachinger, Renn, Begg, & Kuhlicke, 2013); in these previous analyses, gender has been key in explaining risk perception and reactions to climatic risks. The gendered division of labor, along with cultural norms regarding emotional expression between men and women, may lead to different emotional responses between men and women when faced with climatic risk. To understand how gender and sensitivity to climate change interact to produce differentiated emotional reactions, however, it is necessary to use a cross-cultural approach. Thus, we selected four island sites that vary in climate sensitivity (see Table 1 for a description of each site's sensitivity and adaptive capacity, based on the IPCC Summary for Policymakers report [2013]). Because we have ethnographic experts in each site, we are able to draw on their expertise to interpret our results, particularly as they relate to gender norms and different climate change sensitivities to the communities selected in each of these nations.

Table 1. Site Characteristics.

	Viti Levu, Fiji	Wellington, New Zealand	London, England	Nicosia, Cyprus
Population (approx. rounded)	1,000 (2010 est.)	393,000 (2012 est.)	8,170,000 (2011 est.)	110,000 (2011 est.)
Regional water scarcity	Little/none	Little/none	Little/none	Physical
Research site rurality	Semirural	Urban	Urban	Urban
Avg annual high/low temp (in °F [upper], in °C [lower])	83°/71°F 28.3°/21.7°C	60.6°/49.8°F 15.9°/9.9°C	58.5°/42.4°F 14.7°/5.8°C	79.2°/55.8°F 26.2°/13.2°C
Avg annual precipitation	117.1 in.	48.4 in.	29.7 in.	13.4 in.
Projected future temperature change (2080 range, in °C)	+0.9-3.1	+3-4	+1-5.5	+2-3.5
Natural disaster risk	Cyclones, tropical storms, flooding	Earthquake	Flooding	Drought, wildfire
Environmental issues	Coastal erosion, ocean acidification, species decline, rising sea levels	Coastal erosion, rising sea levels, flooding	Urban heat island, air pollution, coastal erosion	Soil erosion, freshwater access
Climate	Tropical monsoon	Temperate marine	Temperate oceanic	Subtropical semiarid

Using data collected from these sites, our research seeks to answer the following questions:

Research Question 1: Is emotional expression more common in locations with greater sensitivity to climate change?

Research Question 2: How does gender intersect with sensitivity to climate change to produce variance in emotional expression among men and women?

Literature Review

Emotion and the Environment

Place attachment, sense of place, and the concept of emotional geographies all provide theoretical understandings of the way that people and communities develop emotional ties to their local environment. Place attachment is the “interplay of affect and emotions, knowledge and beliefs, and behaviors and actions in reference to a place” (Low & Altman, 1992, p. 5) sense of place refers to the identity one tends to build around the local environment (encompassing emotional bonds, values, and meaning constructed in a place; Stedman,

2011; Williams & Stewart, 1998). Drawing on the theoretical approaches from place attachment and sense of place, emotional geographies developed out of a call in the early 2000s to explore the way that emotions become embedded in place and how these emotions and emotional responses draw on things like place attachment and sense of place (Anderson & Smith, 2001). Anderson and Smith (2001), and scholars who have further engaged with emotional geographies as a theoretical orientation, have argued that without an understanding of the emotional responses that people have to their local environments, social scientists have a less than holistic understanding of the human experience, particularly as it happens in the public sphere. Although emotion has often been relegated to the private domain, (Bondi, 1998), scholars who examine the contexts in which emotion is expressed (Sultana, 2011; Wutich, 2009; Wutich & Ragsdale, 2008) indicate that the private is public, particularly when it comes to emotions enacted in the environment.

Previous literature indicates the value of better understanding emotional geographies, but in the era of climate change, it is necessary to understand how the components of vulnerability result in differential emotional responses to climate change among and between men and women. To address how place-based sensitivity affects these different groups, we selected four sites with relatively similar climate change exposure. The IPCC report (2013) on possible climate futures demonstrates that island nations are particularly exposed to certain effects as a result of climate change, including coastal erosion and rising sea levels, coastal storms, changes to local flora and fauna, and changing freshwater access. Predictions from the IPCC (2013) Summary Report for Policymakers indicate that sensitivity to these effects is not equally distributed, however, even across locations that are predicted to have similar exposures. Thus, the sensitivity of each site provides the differentiation necessary to understand different emotional outcomes between and among men and women.

Vulnerability and Sensitivity

Vulnerability encompasses three components: exposure, sensitivity, and adaptive capacity (Adger, 2006; Watts & Bohle, 1993). Exposure refers to the type of hazards individuals and communities are likely to experience, while sensitivity describes the severity with which these hazards are likely to affect communities. Sensitivity is highly influenced not just by location or type of hazard, but also by social and demographic factors, such as race and class, that might increase or decrease a person or group's susceptibility to certain hazards (Cutter & Finch, 2008; Eakin & Luers, 2006). For example, scholarship from India indicates that participation in farming leads to greater risk for

women, particularly in the context of climate change-related disasters (Singh, Feroze, & Ray, 2013). Because of the physical labor these women perform, they are not only more exposed to meteorological- (and thus, climate) related threats, but are also sensitive to the financial threats posed by climate change. Finally, adaptive capacity is generally considered to be the ability of an individual, household, or community to recover from something like a disaster. Although adaptive capacity does not necessarily require that communities return to their initial state, it does explore the strategies that people use to address the damage of a disaster, and may also allow for new strategies to arise, preventing similar damage in the future (Smit & Wandel, 2006; Turner, 2010).

The IPCC (2013) suggests that island nations are particularly vulnerable to the effects of climate change. In addition to concerns about rising sea levels, coastal erosion, and storms, island nations are likely to see changes in freshwater availability, and changes to local species composition, which may affect foodways and local cosmology, in addition to changes in the recreational habits of local community members. While the IPCC (2013) provides compelling evidence for the particular sensitivity of island nations, it provides little distinction in the range of sensitivity different island nations may experience based on their location, and the sociocultural factors that influence life in these areas. Sensitivity to climate change is a necessary distinction to understand current and future effects on local community members. As Stratford, Farbotko, and Lazrus (2013) argue, climate change has already affected the cosmology of Tuvalan residents. Because their livelihood strategies and worldview are dependent on the archipelago, changes such as rising sea level and changes to local flora and fauna not only represent a threat to their ability to provide for their community, but these effects also threaten their well-being and the emotional connection to the landscape that shapes their worldview. While this is very true of Tuvalu, the same may not be true of other locations that have different cosmologies, or have other ways of providing food. In addition, because many Tuvalans live on the coast and have few places to emigrate to, their sensitivity to the effects of climate change is particularly immediate, whereas other, less sensitive island nations may not feel the effects of climate change for many years. Thus, the role of sensitivity to climate change is pressing in understanding how people feel about changes to their local landscape.

Emotion and Gender

Women have long been considered—both in popular and academic views—to be the more emotional of the biological sexes, and much scholarship on

emotion thus far has explored the way that women express emotion, and in what context (R. Lee & DeVore, 1969). However, as anthropologists have noted (Ortner, 1974), gender is not always the distinguishing factor in understanding how people do certain things, or express emotion. Indeed, as Ortner (1996) demonstrated, class differences can play a significant role in determining the similarities and differences between people. While this is no great surprise, this insight has nevertheless not been much applied in thinking about how gender, emotion, and sensitivity to the effects of climate change may align to produce certain emotional responses.

There are a range of gender norms that factor into emotion and the way it simultaneously becomes embedded in place (such as for farmers, who are integrally connected with their land) and acted out in social relations (resulting in outbursts of emotion in public places), as we see among women in Bolivia and Bangladesh (Sultana, 2011; Wutich & Ragsdale, 2008). Indeed, connection to the landscape may result in the transgression of typical norms regarding emotional expression and gender; certainly, if this is the case, it is important to understand how climate change and subsequent changes to the landscape will result in different outcomes for men and women, and how place and sensitivity to climate change may influence these outcomes.

The various modes by which people engage with place and landscapes (e.g., different types of work and labor, exposure to different types of landscapes, including those considered separate from the “natural world”) produce different emotional responses. Cultural expectations of labor and emotion influence the degree to which emotion is expressed, and by whom; studies of the U.S. public suggest statistically significant differences in the way men and women express concerns about environmental risks (McCright, 2010; Larson, Ibes, & White, 2011; McCright & Dunlap, 2011; Figuerido & Perkins, 2013; Bee, 2016; Jost et al., 2016). Cross-culturally, there are cultural reasons for this, including the fact that labor and other tasks are often organized along gendered lines (Goldin et al., 2017; Ray, 2007). For example, previous scholarship in Bolivia (Wutich & Ragsdale, 2008) shows that when water gathering is delegated to women, and water acquisition is difficult and time-consuming, the very terrain where women go to get their water becomes emotionally charged. Similarly, in Bangladesh, Sultana (2011) found that the act of gathering water became a time when women could express their anger and frustration with their lack of safe, potable water.

Psychological studies, conducted mainly in the United States and Western Europe, suggest men are more likely to suppress emotions as a result of both gender norms and past trauma (Fantini-Hauwel, Luminet, & Vermeulen, 2015; Levant, 2011). Other social science studies of masculinity and emotion have demonstrated that men, just like women, often have particularly

nuanced, place-based ways of expressing emotion. For example, men in prison express emotion rarely and avoid burdening other inmates, in spite of prison being an emotionally charged landscape. Thus, emotional displays were mainly acceptable during family visits (Crewe, Warr, Bennett, & Smith, 2014). This research, while not directly related to climate change, indicates that men (like women) have specific times and landscapes where emotion is either acceptable or not, and it is important to better understand the conditions that might affect men and their emotional responses.

Beyond the proposed general tendency to suppress emotional expression, and perhaps also relevant to shaping reactions to climate change, scholars have argued that some men—perhaps particularly men of European descent—are also less likely to feel vulnerable (Marshall, Picou, Formichella, & Nicholls, 2006; McCright & Dunlap, 2011; Satterfield, Mertz, & Slovic, 2004). Nevertheless, there is some limited evidence that men have emotional reactions to extreme weather events, which, in some cases, leads to severe mental health impacts (Alston, 2012; den Besten, Pande, & Savenije, 2016; Sartore, Kelly, & Stain, 2007; Sartore, Kelly, Stain, Albrecht, & Higginbotham, 2008; Udmale, Ichikawa, Kiem, & Panda, 2014). Studies from both Australia and India demonstrate that emotional responses to environmental change have local and societal ramifications. In Australia, prolonged drought has led to farmer suicides as men feel they can no longer fulfill their role as primary providers for their families (Alston, 2012; Sartore et al., 2007; Sartore et al., 2008). Studies of farmer suicide in India indicate that depression and feelings of hopelessness as a result of drought indicate that extreme weather events provoke emotional responses, even among men, who, in other contexts, would express stoicism (den Besten et al., 2016; Udmale et al., 2014). These studies demonstrate the value in understanding how sensitivity to climate change, gender, and emotional response may contribute to different futures with regard to emotional, mental, and physical health. Although the literature provides little guidance on the type of emotional expressions these futures might produce, particularly among men, men's differing vulnerabilities and experience should produce different emotional expressions (Arora-Jonsson, 2011; Resurrección, 2013).

Thus, we hypothesize a gendering of the social, cultural, and landscape influences on emotional responses to climate change. By comparing interview data from four culturally distinct, climate-threatened island communities, and using theories from emotional geographies (Anderson & Smith, 2001; Goldin, 2015; Gorman-Murray, 2010; Sultana, 2011; Wutich & Ragsdale, 2008), our approach here provides novel evidentiary basis to explore the intersection of gender, climate change sensitivity, and emotion. Given the lack of existing theory in these intersecting areas, the use of

systematic cross-cultural comparison as applied here (Ember & Ember, 2009; Hagaman & Wutich, 2017) provides a means to detect broader patterns for generalized inductive theory building about the basic geography of human emotional responses.

Study Sites

Using predictions from the 2013 IPCC Summary for Policymakers, we argue that the four island nations selected for this study have similar exposures under climate change, but vary in sensitivity. The IPCC (2013) report uses historical and current meteorological data, along with multiple models to predict possible futures as a result of climate change. Ethnographic data from key informants in each site, which provide background on the assets and flexibility in livelihood strategies of each site, give this study a more nuanced understanding of the social sensitivity of each study site. Using a combination of ethnographic information and the IPCC (2013) climate data, we argue that, of our four sites, Fiji is the most sensitive to the impacts of climate change, while the United Kingdom is the least sensitive. Additional information regarding each site is given below; sites proceed from most to least sensitive.

Viti Levu, Fiji

Ethnographic data were collected in a remote coastal village in western Viti Levu, Fiji ($n = 68$). The village has a population of about 300 people of Fijian and Indo-Fijian descent (see Table 2 for more information about respondents). Most residents live close to the coast and make their living from tourism and fishing. As with most island nations, Fiji is vulnerable to a number of climatic changes (IPCC, 2013; see Table 1). By 2080, the area is likely to increase 1 to 3°C, and the region is expected to see a decrease in precipitation. While forecasts of precipitation in monsoonal areas in lower latitudes are unreliable, fluctuations in precipitation are nevertheless likely.

Viti Levu is also vulnerable to the same climate effects as other island sites; expected changes include coastal erosion and sea level rise, ocean acidification, and increased frequency and intensity of coastal storms. While most other island nations and states are expected to see similar changes in climate, Viti Levu has less adaptive capacity than other island nations. Because it is a low- to middle-income country, Fiji lacks the ability to immediately rebuild and repair after a major storm. Because the area is remote, the immediacy of any response is not likely to be quick, leaving small local villages to fend for themselves in times of extreme weather. Sea level rise is already a

consideration for the village and the surrounding landscape, and because Fiji is composed of smaller islands, there are few places for residents to move; although they may be able to relocate, research has already demonstrated the devastating emotional effects of relocation as a result of climate change (Farbotko & McGregor, 2010; Stratford et al., 2013) and other environmental changes (Pini, Mayes, & McDonald, 2010; Sartore et al., 2008).

Nicosia, Cyprus

Nicosia ($n = 40$) is the shared capital of the Republic of Cyprus and the Turkish Republic of Northern Cyprus (TRNC). Nicosia has a population of approximately 110,000 between its Cypriot and Turkish Cypriot citizens (see Table 3 for more information about respondents). Unlike the other island sites in this study, Cyprus is already water scarce. Most of the freshwater sources in Cyprus are in the Republic of Cyprus, although much of the farming occurs in the TRNC. Because of political divides between the two sectors of the island of Cyprus, very little freshwater from the Republic of Cyprus is shared with the TRNC. Instead, the TRNC relies on freshwater pumped from mainland Turkey. In spite of the freshwater resources in the Republic of Cyprus, most Cypriot citizens engage in gray water reuse, and 100% of the wastewater from the Republic of Cyprus is reused to mitigate their vulnerability to water scarcity.

In spite of these reuse efforts, the climate change scenarios posited by the IPCC (2013) indicate a likelihood of increased water shortages by 2080. Whereas the other island sites in this study see large amounts of precipitation, Cyprus does not, and they are likely to see a decrease of 5% to 10% by 2080. In addition, they are likely to see an increase in temperature by 2 to 3.5°C (see Table 1). Although Nicosia and the island of Cyprus are not impoverished, their industries (including farming and fishing) are likely to suffer as a result of climate change, and with increasing temperatures and decreasing water supply, the island is vulnerable to changes in infrastructure and adaptive capacity.

Wellington, New Zealand

Wellington is the capital of New Zealand, and is in the southwest portion of the northern island of New Zealand ($n = 86$). As a port city, it is an industrialized city with an economy based on tourism. About 500,000 people of various descent and ethnicity live in and around the bay of Wellington (see Table 4 for more information about respondents). Because of its climate, Wellington has relatively low water scarcity; however, because it is directly on a bay, it experiences tropical storms. As with most island nations, the IPCC (2013)

indicates that New Zealand is vulnerable to coastal erosion and changes in sea level.

By 2080, the IPCC (2013) estimates that Wellington will experience an increase in temperature by up to 4.0°C, accompanied by a decrease of 5% to 10% in precipitation (see Table 1). In addition, as coastal storms increase in frequency and intensity, it is likely that Wellington will be affected by cyclones and typhoons with increasing frequency. Coastal erosion and sea level rise will likely be exacerbated by these changes to coastal storms. Although Wellington has good adaptive capacity, a serious tropical storm could threaten the infrastructure and economy of the area.

London, United Kingdom

London is the capital of England in the United Kingdom ($n = 78$). It is a city of up to 8 million people, of diverse ethnicity and religion (see Table 5 for more information about respondents). Like Wellington, London has little water scarcity as a result of its climate. As the capital of the United Kingdom, London is an important player in the global economy and includes a wide diversity of industries that contribute to the local and regional economy. Due to its location directly on the Thames, London is already susceptible to flooding; although the city of London has made infrastructure alterations to prevent flooding, the effects of climate change mean that these infrastructural changes may not be sufficient.

The IPCC (2013) forecasts that, by 2080, London may see as much as a 5.5°C increase in temperature (see Table 1). Unlike the other three sites, precipitation in London is expected to increase by 5% to 10% by 2080, leading to concerns about the ability of the infrastructure along the Thames to handle sudden influxes of rainwater. Although London itself is not directly vulnerable to coastal erosion and sea level rise, outlying coastal towns in England and the rest of the United Kingdom are likely to experience these effects, which may lead to population increases in London and additional infrastructure challenges as climate change causes people to move away from more exposed locations.

Method

Questionnaire Design and Data Collection

We developed a semistructured interview protocol that examined three parallel dimensions of climate change experiences. Questions were asked in a parallel format to elicit emotional responses in three domains: climate change

and its effect on the respondent, the effect of climate change on livelihoods in the area, and how climate change affects the younger generation. Questions were designed to elicit emotional responses by emphasizing questions about how the respondents felt about these three domains in the context of climate change. Subsequently, respondents answered 31 closed-ended questions about experiences with the local environment, and how they felt that climate change was affecting various aspects of their local ecology and their personal well-being. This protocol was extensively pretested to ensure that questions were appropriate and comprehensible (DeMaio & Rothgeb, 1996). In addition, ethnographic experts from each region reviewed the protocol and made site-appropriate changes before the research began.

In total, we interviewed 272 respondents, with a minimum sample of 40 respondents in each site (68 in the Fiji site, 40 in the Cyprus site, 86 in the New Zealand site, 78 in the London site). Although there are important cultural and socioeconomic differences across these four sites, the per site sample size exceeds the minimum recommended number of interviews to facilitate metathematic comparisons in cross-cultural and multisited research (Hagaman & Wutich, 2017). Interviewers employed a nonprobabilistic, purposive sampling strategy in each of the four communities (Bernard, Wutich, & Ryan, 2016) with the goal of recruiting a diverse group of respondents in each location (Guest, 2014). This included sampling equally among men and women, and also targeting respondents to recruit a range of ages, professions, and ethnicities. We collected data in public locations, which is appropriate for purposive cultural samples designed for research on shared cultural and environmental knowledge (Handwerker & Wozniak, 1997).

Data Analysis

The purpose of the analysis is to understand the way emotion words were used by different groups of people in each site and across the four sites. Once data were entered, we used preestablished lists of emotion words (G. W. Ryan & Weisner, 1998; Saldaña, 2009; Seale, Ziebland, & Charteris-Black, 2006; Taylor, Thorne, & Oliffe, 2015) to conduct a word-based analysis (known as “key-words-in-context” or KWIC) in MAXQDA software. Each interview was coded for emotion words; the coding segment was the word. When coding was complete, we explored the context of emotion words used in each interview to understand how different emotion words were being used. Using data from the IPCC Summary for Policymakers report (2013), we estimated the climate change sensitivity of each study site. This estimation informs our subsequent analysis regarding the intersection of sensitivity and gender.

Within each question (and within each interview), a single emotion word could be used multiple times; to address this, the data were exported to SPSS and emotion words were dichotomized to indicate presence or absence of each emotion word within a single interview. Using the dichotomized data, we ran chi-square tests to analyze the degree to which emotion word usage varied by gender across and within sites. To address Research Question 1 (how variance in sensitivity to climate change futures results in differences in emotional responses across sites), we used chi-square tests to examine whether men or women were more likely to use emotion words across and within sites. Subsequent thematic analysis allowed us to understand the context in which respondents used emotion words. With regard to Research Question 2, special attention was paid to the gender of individual respondents to understand variation in emotional response. Additional attention was dedicated to understanding the sensitivity and adaptive capacity of each research site based on information from key informants and future climate projections (IPCC, 2013).

Results

Across the four sites, men and women both expressed emotional responses to climate change. Although men and women both described feelings of hope, often for the future generation, negative emotion words were more commonly used in the context of describing their feelings about climate change (not shown).

Our results indicate that gender and sensitivity to the effects of climate change within each site did not substantially intersect to produce differences in emotional response within the four sites (Research Question 1). However, the data indicate that, regardless of gender, sensitivity to the current and future effects of climate change produces differences in emotional responses. Specifically, emotional expression is more common in more sensitive locations of Cyprus and Fiji (see Figure 2 and Tables 1 and 2).

Men and women across the four sites expressed different emotional responses, indicating that gender matters, and that it produces different emotional responses when analyzed in the context of climate change sensitivity (Research Question 2). Across the four sites, women were significantly more likely to express sadness ($\chi^2 = 5.23, p = .03, \phi = -0.15$; see Figures 1 and 2) (see Tables 2-5). Women typically expressed sadness in the context of their local ecology or in the context of the younger generation (see Table 6); often these contexts intersected when women discussed the way that changes to the local ecology would affect the younger generation. When women described

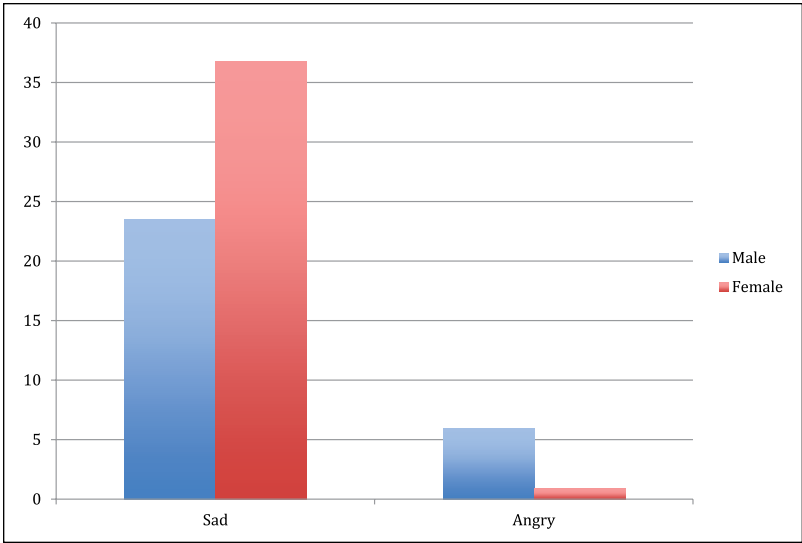


Figure 1. Showing the use of “sad” and “angry” between men and women across four sites.

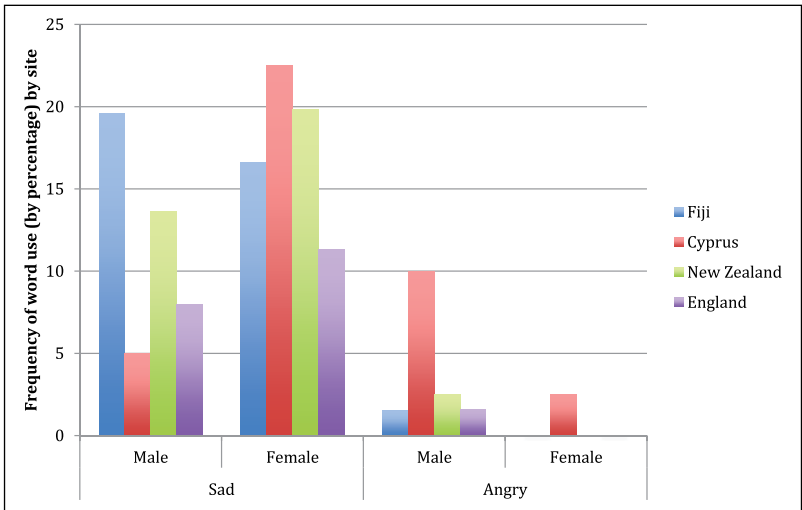


Figure 2. Showing the use of “sad” and “angry” by gender and site.

Table 2. Respondent Characteristics—Fiji.

Demographics	Frequency	%
Gender		
Female	35	51.5
Male	33	48.5
Sad		
Present	24	35.3
Absent	44	64.7
Angry		
Present	1	1.5
Absent	65	98

Note. *n* = 68.

their sadness at the changes to their local ecology, they often talked about the way the changes to their home and their landscape affected them or their family. For a woman in New Zealand, this included changes to local flora and fauna, as well as the weather: “[I’m] sad; this is my home. The trees are going down; [I’m] sad to see hometown changing (weather).” Women also indicated that they had a deep attachment to their landscape, and were accustomed to seeing it a certain way; thus, changes to the landscape made them feel sad at the loss.

In addition, some women expressed that the changes to the landscape affected their families and their traditions, and the changes therein also made them sad (see Table 6). As a woman from the United Kingdom noted, her family farmed and hunted, and she saw climate change altering those traditions and making them harder or less accessible. While she lived in London, she nevertheless expressed an attachment to those familial traditions, and felt sad at the possibility of changes or full-scale loss of those traditions. Women in Fiji often expressed concern for the local ecology in the context of the younger generation. As one respondent said, “[I feel] sad. Life will be hard for people in the future. [The] soil and fruit could be different.” Her response demonstrates that people are accustomed to the current climatic regime, and the way they are able to provide for themselves is closely linked to that; a common view was that the changing local ecology will make that harder for the future generation. Similarly, a woman from Cyprus said, “It will be very sad because the situation of the island is really good now, and the animals will have problems here.” The changing local ecology makes women feel sad not just because they appreciate nature, or because the current landscape evokes a sense of home; instead, these women demonstrate and evoke sadness in

Table 3. Respondent Characteristics—Cyprus.

Demographics	Frequency	%
Gender		
Female	19	47.5
Male	21	52.5
Sad		
Present	11	27.5
Absent	29	72.5
Angry		
Present	5	12.5
Absent	35	87.5

Note. $n = 40$.

response to the loss of fundamental aspects of the local ecology that have provided for their families in the past.

Across the four sites, women also expressed their sadness in the context of the younger generation, and the possible loss of cultural values and economic opportunities as a result of climate change (see Table 6). A Fijian woman explained her sadness for the younger generation: “It makes me feel sad. But in case they come back, we always push them to learn everything again, and we have protected water for them to fish in when we’re gone.” She explained that many people in the younger generation have left the island to pursue economic opportunities elsewhere, and that they’ve lost cultural knowledge as a result. As a woman’s response in England demonstrated, sadness about the younger generation was a common theme: “[I’m] sad because I want the same opportunities available for future children as well.” Some women thought about these opportunities in terms of jobs and other future prospects, while others expressed sadness for the younger generation by comparing their opportunities with their own. A Cypriot woman said, “I think it’s sad—they won’t be able to live how we live.” Women often expressed sadness that their children wouldn’t have the same experiences they had as a result of climate change. In addition, women indicated that the future generation would have a more burdensome future, and that made them sad as well. Although the sensitivities across these four sites vary, as do the cultural perspectives, women nevertheless frequently evoked sadness as a primary emotion in the context of climate change.

While men also expressed a great deal of sadness in the four sites, often in similar contexts, overall, they were significantly more likely than women to express their anger as a result of climate change ($\chi^2 = 4.83, p = .03, \phi = 0.14$;

Table 4. Respondent Characteristics—New Zealand.

Demographics	Frequency	%
Gender		
Female	39	45.3
Male	47	54.7
Sad		
Present	27	31.4
Absent	59	68.6
Angry		
Present	2	2.5
Absent	79	97.5

Note. *n* = 86.

Table 5. Respondent Characteristics—London.

Demographics	Frequency	%
Gender		
Female	32	41.0
Male	46	59.0
Sad		
Present	16	20.5
Absent	62	79.5
Angry		
Present	1	1.6
Absent	61	98.4

Note. *n* = 78.

see Figure 1 and 2 and Tables 2-5). Men expressed anger in three broad but different ways. Some men explained that they were angry because of the way climate change was affecting the younger generation. Still others felt that climate change was affecting them personally, and felt angry about that. Several men also expressed anger in the context of governmental failure to do anything about climate change. The notable exception to this occurred in Fiji, where only one man expressed anger about climate change; this may be the result of social and cultural expectations about emotional expression.

While expressions of anger were most prevalent in Cyprus, men across the other two sites also frequently expressed anger, particularly in the context of the younger generation. When men expressed anger about the effects of climate change on the younger generation, they talked not only about changes to the

futures of the younger generation, but also about the way that it would affect well-being (see Table 6). As a Cypriot man explained, "It will affect them a lot. They will be negative. They won't be friendly any more. It will affect psychology. All chemicals, burning forests, heat; it makes people angry." Another Cypriot man felt angry because the weather might become so bad that members of the younger generation would leave the island for cooler climates, and that this would be upsetting and disturbing to those who left. Both men indicate that climate change will directly affect the emotional well-being of the younger generation; while the respondents weren't personally angry, they were concerned that climate change would affect the psyche of the younger generation. Men in other sites also indicated that they were angry on behalf of the younger generation. In London, men indicated that there would be more pollution for the younger generation, and this made them angry on their behalf. Although anger was not a commonly expressed emotion in Fiji, one man said, "I will feel bad and angry because that's [the] future of young children."

Men also expressed anger when they felt that climate change was threatening them personally. As a man in London indicated, "[It's] more personal, because I have a personal connection with agriculture. [I'm] very angry because the future is shortsighted." For these men, climate change, and the decisions that have led to the changes they are already observing feel deeply personal. While not all of the male respondents who expressed anger in this context made their living off the land, they nevertheless felt that climate change was a threat to their well-being, which provoked anger. A man in New Zealand typifies this response: "It makes me angry to think that people don't want me to succeed and be happy. I'm frustrated as well." Respondents also noted that the rate at which climate change is happening, and the fact that climate change is already affecting their ability to be successful, is angering and upsetting.

Finally, men expressed anger in the context of inaction. For this Cypriot man, the lack of political action on the part of his government in relation to climate change is particularly causing anger in him:

I have no emotional reaction. I'm not standing in the way of change. We need a political system that allows us to invest and make changes in a timely manner, and we don't have that right now. We need forward thinking. I get angry that we don't have forward-thinking people in power. We only respond to a crisis and put people through unnecessary stress. Go to Dubai, they have less water but can turn on the tap because they are forward-thinking and have come up with solutions.

While most men expressed anger in the way that climate change was affecting them or others, this response shows a different type of emotional

Table 6. Sadness and Anger in Four Cross-Cultural Sites; Themes From Interviews Based on Respondent Gender (Subthemes in Italics).

	Viti Levu, Fiji		Nicosia, Cyprus		Wellington, New Zealand		London, United Kingdom		
	Women	Men	Women	Men	Women	Men	Women	Men	
Sad	For the younger generation <i>Changes to local environment will affect younger generation</i> Changes to local environment	For the younger generation <i>Nostalgia; sadness at how younger generation won't have the same experiences</i> Changes to local environment	For the younger generation <i>Nostalgia; sadness at how younger generation won't have the same experiences</i> Changes to local environment	Changes to local environment <i>Changes to local environment will make it hard for anyone to make a living</i>	Changes to local environment <i>Sad to see changes to local environment and home</i>	Changes to local environment <i>Might cause hardship for people making a living off the land</i>	Changes to local environment <i>Changing traditions in countryside</i> For the younger generation <i>Nostalgia; sadness at how younger generation won't have the same experiences or opportunities</i>	Changes to local environment <i>Others are not taking responsibility for actions</i>	At inability to cause change <i>For family and younger generation</i>
Angry	For the younger generation <i>Loss of a good future</i>	For the younger generation <i>Loss of a good future</i>	At inability to cause change <i>For the future, for children</i>	At inability to cause change <i>(for younger generation)</i> Sense of anger <i>at political structure's failings</i>	At others <i>Others are not taking responsibility for actions</i>	At others <i>Other people do not care enough to ensure that they succeed</i>	At others <i>Others are not taking responsibility for actions</i>	At inability to cause change <i>For family and younger generation</i>	

expression; this response indicates that there is a level of frustration that goes beyond the personal to a different scale, and that there is a level of interaction between the personal experience and the more global experience of climate change. Indeed, the lack of action on the part of the government, and the comparison with another government, indicates a broader anger. This man from London expressed a similar type of anger: "Safety is the most important in protecting family, and more preparedness. [I'm] angry for not changing the status quo." For these men, the status quo is stymieing and angering; they feel that the lack of action is perhaps worsening the long-term effects of climate change, which could no doubt feed into anger and concern for the younger generation and their personal well-being.

Discussion

Previous research indicates that men and women may not be equally vulnerable to climate change, and further, that it is necessary to differentiate the types of vulnerability women and men experience by location, class, ethnicity, and culture perspective (Alston, 2014; Arora-Jonsson, 2011; Goldin et al., 2017; Resurrección, 2013; Sartore et al., 2007; Sartore et al., 2008; Singh et al., 2013). Although our study could not address the other social factors that contribute to variance in sensitivity to the current and future effects of climate change, our study aimed to better understand how sensitivity based on location, approximated using data from the IPCC Summary for Policymakers report (2013) could lead to differences in emotional responses to climate change across sites. In addition, our study addressed the intersection of gender and sensitivity to better understand how men and women, within and across sites, might express emotion differently as a result of climate sensitivities. Finally, because research has largely assumed that men suppress emotion (Fantini-Hauwel et al., 2015; Levant, 2011), we sought to understand how and when men expressed emotion across four island nations. To achieve this, our study asked respondents a series of questions about how they felt about the effects of climate change on themselves, their families, and their local communities.

While sensitivity as the result of race, class, and other global socioeconomic factors may influence emotional responses in ways that we were not able to capture in this study, variance in biophysical sensitivity to climate futures did not produce significant results with regard to emotional expression. In their responses, respondents across the four sites express emotions in response to the current and future effects of climate. It is worth noting, however, that the more sensitive sites of Cyprus and Fiji express emotion more frequently. As the literature notes, however, men and women experience gendered vulnerabilities

(Alston, 2014; Arora-Jonsson, 2011; Goldin et al., 2017; Resurrección, 2013; Sartore et al., 2007; Sartore et al., 2008; Singh et al., 2013). Our data indicate that gender, as well as sensitivity to climate change does produce different responses (see Figure 2). There are important additional cultural factors that need to be addressed, such as the reasons that men in Fiji rarely express anger, whereas men in Cyprus commonly express anger. As in many Pacific cultures, it is inappropriate to express anger, which is seen as a socially disruptive force (Gervais, 2013). Understanding cultural norms regarding emotional expression is vital to better understanding the interplay of emotion, vulnerability, and local context. It is clear from our results, however, that context does matter. While women are overall more likely to express sadness and men anger, the cultural context in which these emotions are expressed varies, often in relation to the degree of vulnerability in each place.

The responses by men and women across the four island sites indicate first that, in contrast to much of the expectations in the literature, men in our study expressed emotion slightly more frequently (although not significantly more) than women. In addition, our data show that men are more likely to express anger in response to climate change, while women are more likely to express sadness. Previous research indicates that women will be likely to express emotion in a range of circumstances, while men will be more likely to express hypermasculinity or alexithymia in response to these challenging circumstances (Crewe et al., 2014; Fantini-Hauwel et al., 2015; Levant, 2011; Sultana, 2011). In contrast to the research on alexithymia and male suppression of emotion, our study shows that men do express emotion, particularly anger in the context of climate change. While that fits with general societal expectations of the emotions men (and women, in their sadness) would be likely to express, it nevertheless indicates that men will freely express emotions when faced with the changes to their landscapes and economic success (Alston, 2012; Sartore et al., 2007; Sartore et al., 2008).

Our research suggests that while men and women each express emotion, they do so in very different contexts, which often varies by site. For women, sadness occurs in response to two different domains: sadness about changes to the local landscape and changes for the younger generation. Although women in all four sites indicated that they felt sad about these outcomes, women in the more biophysically sensitive sites (Fiji and Cyprus) were more likely to express sadness and frustration at the changes to the landscape. These respondents also often tied changes to the landscape to the loss of opportunities for the younger generation. While these respondents indicated sadness for the younger generation, they simultaneously highlighted changes to the local ecology, and the sadness that evokes. Women in the sites with

greater adaptive capacity (New Zealand and the United Kingdom) tended to indicate that they felt sad more for the younger generation, particularly in their inability to live the way that they (the respondents) had. Respondents not only often said this in the context of economic opportunities, but also made these remarks in the context of not having the same life experiences, indicating a sense of nostalgia for the “good times.”

Men in this study similarly expressed emotion, although they were more likely than women to indicate that they were angry, rather than sad. In general, anger is considered a less vulnerable emotion than sadness, which might make it a more permissible emotion among men, who might be expected to display hypermasculinity (Crewe et al., 2014). While anger is not an unexpected response, given the research on the context in which men feel safe expressing emotion (Crewe et al., 2014; Pini et al., 2010), it does indicate that, unlike research on suppression of emotion (Fantini-Hauwel et al., 2015; Levant, 2011), men are willing and able to express emotion, particularly in the context of loss and frustration. For men in the more sensitive sites of Fiji and Cyprus, anger was commonly expressed in terms of changes for the younger generation, and the possibility that the younger generation wouldn't have the same resources and opportunities. It should be noted, however, that only one man in Fiji expressed anger. This may be because, for many Pacific societies, anger is considered socially disruptive and dangerous, and is therefore proscribed (Gervais, 2013). In the United Kingdom and New Zealand, however, men were more likely to indicate anger at the way that political inaction was leading to personal difficulties, including feeling that they couldn't succeed in the face of climate change. This feeling that climate change is a very personal concern did not come up in the same way with female respondents, and indicates a potentially stark contrast in the way that men and women are experiencing climate change. In addition, the personal sense of climate change in the less sensitive sites is noticeably different from the way men expressed anger in the more sensitive sites. Thus, variance in sensitivity to the effects of climate change may be an important predictor of the context in which emotional expression is permitted and acceptable.

The differences in the way men and women express emotion in the more and less sensitive sites is an important insight. Although women's expression of sadness fits with expected cultural norms, the context in which sadness is expressed varies across sites, indicating, as Arora-Jonsson (2011) and Resurrección (2013) argue, that women should not be homogenized into a singular category. Although the type of emotion might be the same among women, the degree of sensitivity across these four sites produces contextual differences in emotional response. This research also demonstrates that men are also at risk of being homogenized and presumed to be less vulnerable as a

whole to the effects of climate change (Marshall et al., 2006; McCright & Dunlap, 2011; Ortner, 1974; Satterfield et al., 2004). While vulnerability studies have demonstrated that men are generally less vulnerable (Cutter & Finch, 2008), it is clearly important to consider the way that gender intersects with other factors (such as vulnerability) to produce emotional responses. Our data demonstrate that, even when people use the same emotion word in response to climate change, the degree of vulnerability is linked to the context in which these emotions are expressed. What is notable is that men and women aren't expressing emotion in the same contexts in the same sites; for example, while women in Fiji and Cyprus tend to express sadness for the changes to the landscape, in these same sites, men are expressing anger on behalf of the younger generation. Thus, biophysical vulnerability, and more particularly, biophysical sensitivity and adaptive capacity may not be good predictors for the context in which men and women in the same site will express emotion.

While the differences in the emotional responses between men and women within each site require further exploration, our findings demonstrate that climate change will likely have different consequences for men and women. Anger has traditionally been a motivating force and may lead to political action for men who express this emotion (Reese & Jacob, 2015; Sultana, 2011). While anger is the emotion more commonly associated with men, and therefore, with potential political action, it is necessary to consider what happens when anger dissipates. As cases in India and Australia demonstrate (Alston, 2014; Bryant & Garnham, 2015; Sartore et al., 2007; Sartore et al., 2008), men may experience serious mental health concerns that lead to broader community issues. For women, the degree of sadness expressed indicates that climate change may produce significant mental health consequences. The previous studies (Alston, 2012, 2014; Sartore et al., 2007; Sartore et al., 2008) that demonstrated the mental health effects on men could easily be translated to the effects on women. The understanding of emotion as it pertains to climate change offers an important insight into the way that emotion is fundamental to the everyday experiences of individuals. This perspective also emphasizes the way that emotion is coconstitutive with experiences with climate change; thus, to understand the way that climate change affects individuals and community members, it is necessary to understand the fundamental role of emotion.

Conclusion

Scholars have long considered how human–environment connections are gendered. The notion that women were more intrinsically connected to nature, while men were more connected to culture, has a long history in

anthropological thought (e.g., R. Lee & DeVore, 1969), and has even emerged as a fundamental tenet of the eco-feminist movement (Merchant, 1992). However, empirical evidence is needed for adequate theory building, and the findings here emphasize that men—in an array of cultural and environmental settings—also express emotion related to environmental change—although more commonly it is in the form of anger.

As emotional geographers have argued, emotions are central to understanding the experiences of people; emotion is often embodied in place, and as places change, it is important to recognize and understand the emotional responses of community members who experience these changes. Without research that explores the emotional dimensions of climate change, we have an incomplete understanding of how climate change affects communities with different levels of sensitivity. It is also particularly important to consider gender norms in emotional expression, and how these norms might affect the men's and women's emotional geographies. Recognizing that men's emotional vulnerabilities to climate change exist, in spite of generally lower environmental risk, is an important theoretical point. Especially given the differences in the patterns between women's emotional vulnerabilities to climate change and men's vulnerabilities to climate change, it is necessary to understand the intersection of gendered environmental experiences and sensitivity to climate change to develop a holistic understanding of the effects of environmental change on men and women across different environmental contexts.

We have shown through this analysis that living in locations that are biophysically vulnerable to the effects of climate change produces significant emotional responses for *everyone*, even if it is displayed more as sadness among women and anger among men. Both genders express strong emotional responses to perceived changes in local ecology, related loss of economic opportunity, and the implications for the younger generation. Our research demonstrates that variance in sensitivity to climate change futures produces emotional responses across island nations; however, the context in which emotion is expressed varies by sensitivity and, often, by gender. For island nations with more immediate climate change effects (Fiji, Cyprus), the emotional responses are stronger among both men and women. While sensitivity to climate change varies across the four sites, in general, men were more likely to express emotion, particularly anger. Fiji is the lone exception to this, likely as a result of cultural norms regarding anger.

While our findings indicate the important role of gender and sensitivity to climate change, future research must also explore the ways that socioeconomics and cultural perspectives frame emotional responses to climate change to gain a more intersectional perspective. There are clear cultural differences at play here, as demonstrated by the differences in men's emotions

expressed in Fiji. Thus, additional research should focus on understanding local, regional, and national differences in experiences with climate change to better address cultural and socioeconomic perspectives that also contribute to variance in experiences with climate change. In addition, future research could explore the way that specific climate-related events evoke different emotional responses, and the way that emotional responses are differentiated within communities along intersecting lines of vulnerability, race, and poverty. Moreover, as men are key power brokers in climate change policy formulation and implementation in most places, understanding how gender feeds into reaction and perceptions of risks should help in creating pathways to sustainable mitigation of those climate risks.

Authors' Note

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Author Biographies

Margaret du Bray is a postdoctoral researcher with the Established Program to Stimulate Competitive Research (EPSCoR) Managing Idaho's Landscape for Ecosystem Services project at Idaho State University. Her research focuses on human–environment interactions in changing landscapes and includes examinations of emotional geographies of climate change, novel governance strategies for resource management, and the lived experiences of adaptation.

Amber Wutich is director of the Center for Global Health at Arizona State University (ASU), and faculty in ASU's anthropology program. Her research examines institutional injustice and environmental health disparities, with an emphasis on methodological innovation. She directs the Global Ethnohydrology Study, a cross-cultural study of water knowledge and institutions in 10 countries. She serves as associate editor of the journal *Field Methods* and taught in the National Science Foundation's programs in research methods for cultural anthropology.

Kelli L. Larson is an associate professor in the School of Geographical Sciences and Urban Planning as well as the School of Sustainability at ASU. Her research focuses on human–environment interactions in the context of water resource governance and urban sustainability.

Dave D. White is professor in the ASU School of Community Resources and Development. His scholarship is focused on understanding and enhancing the linkages between science and policy for sustainability. He also serves as director of the ASU Decision Center for a Desert City, which brings together scientists and stakeholders to develop transformational solutions for water sustainability transitions.

Alexandra Brewis is president's professor at ASU. Trained as an anthropologist, she has a long career of leading multisited community-based field research across the globe, addressing the biocultural dimensions of complex health issues (including attention deficit hyperactivity disorder [ADHD], infertility, family planning, depression, nutrition, and water insecurity). She is an American Association for the Advancement of Science (AAAS) fellow and president-elect of the Human Biology Association.