



**Emergency Management Principal Investigator's
Meeting
11th May, 2011**

Public risk perceptions, understandings, and
responses to climate change and natural disasters
in Australia and Great Britain

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Current program focus and research fronts:

- 1. The social representation of climate change and natural disasters
 - a. (threat and consequences)
 - b. (direct and indirect)
- 2. Public risk perceptions, understandings, and responses to climate change and natural disasters
- 3. Psychological and social (psychosocial) environmental impacts of the threat of climate change and natural disasters
- 4. Measuring and monitoring important psychological and social changes in the human landscape in response to the threat and unfolding impacts of climate change



Program focus – continued:

- 5. The establishment of a database, standardised measures and protocols, and research monitoring program to document these changes and impacting processes
- 6. Development of a psychological preparedness intervention and associated evaluation for climate change and natural disaster threat
- 7. Currently addressing psychological vulnerability and resilience
Objective/subjective exposure

MEDIATING REPRESENTATIONS OF 'CLIMATE CHANGE'



LOCAL ENVIRONMENT

sense making - Risk appraisal - Response

social construction of reality - Social amplification of risk

EVERYPERSON



MEDIA CHANNELS

Television
www
radio
Texts

editing - Framing - Representation

JOURNALISTS

*photographing - Video Recession
interviewing*



GLOBAL ENVIRONMENT

Events
Processes
Impacts

social construction of reality - Social amplification of risk

monitoring - Risk assessment - Mitigation



FRIENDS - FAMILY & ACQUAINTANCES

Legislating - Policy making - Risk management

risk management responses



ENVIRONMENTAL AGENCIES
GOVERNMENT BODIES



SCIENTISTS/EXPERTS

Angela Kreutz and Joseph Rose, University of Queensland and Griffith University, j.rose@griffith.edu.au



Convergent perspectives:

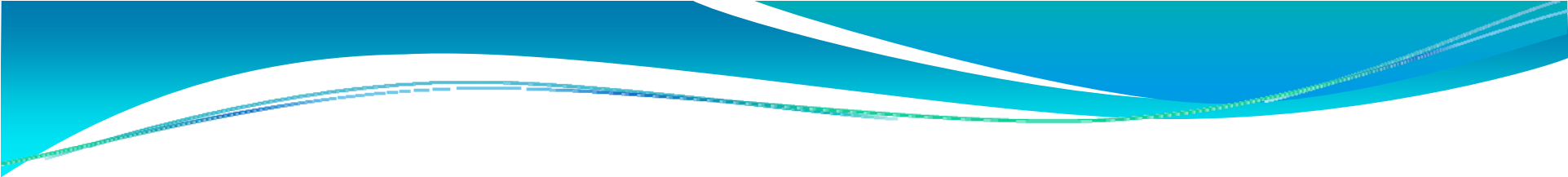
- Environmental psychology
 - Social psychology
 - Risk communication
 - Health and clinical psychology
 - Evaluation research
 - Cognitive psychology
 - Motivation
- Global environmental change
 - Environmental concern and fostering of pro-environmental behaviour
 - Disaster social science and psychology
 - Social construction and representation of environmental risk
 - Social amplification and attenuation of risk
 - Media studies and psychology
 - Risk perception and communication
 - Public understanding of science and public engagement
 - Environmental stress
 - Stress and coping
 - Psychosocial environmental impact assessment (PSIA)
 - Environmental discourse
 - Interdisciplinary and transdisciplinary engagement and applications



Public risk perceptions, understandings and responses to climate change and natural disasters

'Climate change' is more than climate change phenomenon, threat impacts, human consequences, risk domain, attitudinal object, environmental, social, political issue, global and local, etc.

Public is Australian public but also UK, Europe, U.S. And world. Differing vantage points by age, gender, education, residence, exposure, direct experience, knowledge, understanding, individual level analysis but aggregated.

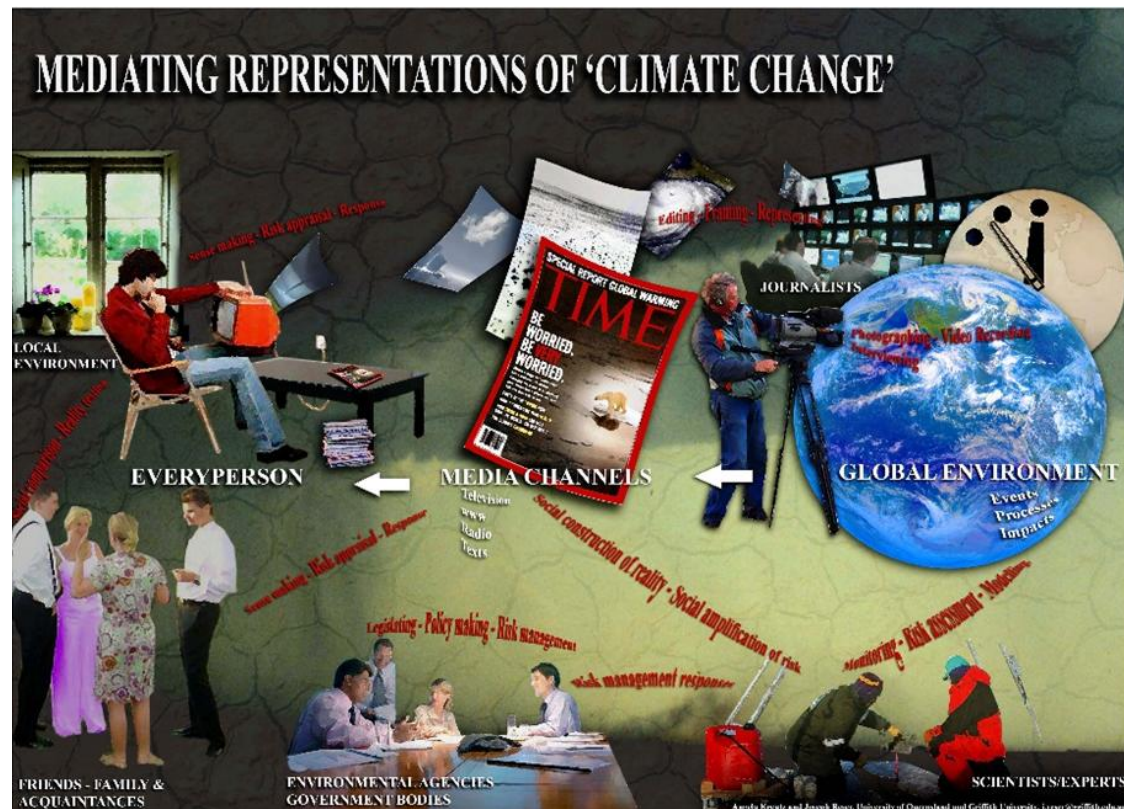


Risk perceptions flags environmental threat, cultural risk domains, risk appraisal versus risk assessment, subjective versus objective exposure, information environments, social representations of risk, risk communication, etc.

Understandings encompasses but reframes opinions, attitudes, beliefs, values, causal attributions, knowledge, concerns, and implicates not only individual sense making, but social comparison, social construction, social amplification of risk, etc.

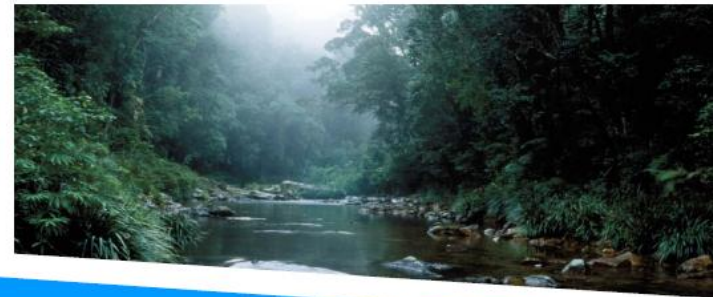
Responses are not just social, community, and societal but psychological, individual and are integrally related to perceptions, appraisals, and understandings. Responses are intra individual as well as behavioural and social, emotional as well as cognitive, motivational as well as decision-based, psychologically significant as well as environmentally significant (PSBs versus ESBs). Responses relate to impacts and impacting processes.

We are talking about change. Not just change in climatic systems and unfolding physical environmental impacts and consequences, but changes, responses and impacts in human landscapes and behaviour settings. Hence there is always an underlying framing in terms of measuring and monitoring, not only threatening processes and events, but human sense making, risk representation, responses, impacts, adaptation, and mitigation.



Interim report:

- Griffith University School of Psychology and Cardiff University Understanding Risk Centre national survey collaboration (Reser, Pidgeon, Spence, Bradley, Glendon, & Ellul, 2010-2011)



PUBLIC RISK PERCEPTIONS, UNDERSTANDINGS, AND RESPONSES TO CLIMATE CHANGE IN AUSTRALIA AND GREAT BRITAIN: INTERIM REPORT



Authors: Joseph P. Reser, Nick Pidgeon, Alexa Spence, Graham Bradley, A. Ian Glendon & Michelle Ellul.
Institutions: Griffith University, Climate Change Response Program, Queensland, Australia, and Understanding Risk Centre, Cardiff University, Wales



Public risk perceptions, understandings, and responses to climate change in Australia and Great Britain

Objectives for survey

- Establish practical methodology and procedure from longitudinal data collection
- Decide on and/or design meaningful and sensitive items, measures, and indicators
- Use interval level rating scales and response formats where possible and strategic
- Use multi-item scales for important constructs and parameters
- Include some open-ended and qualitative items and response formats
- Establish a data base for documenting and researching intra-individual and extra individual changes relating to psychological behavioural adaptation and impacts



Requirements and limitations

- Collaboration with Cardiff University
- National coverage and representation
- Climate change and disaster focus
- Survey methodology constraints
- Within subject design requirement
- Highly politicised and polarised issue
- Information environments and virtual exposure
- Comparability and standardised construct specification and measurement
- Multiple history effects



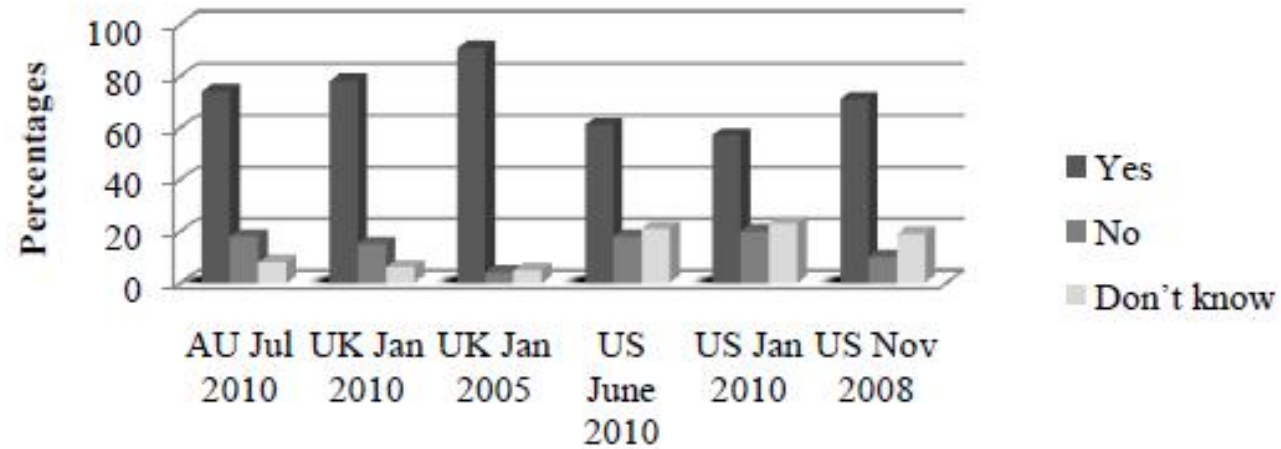
Method

- The survey sample sizes were 3096 for Australia and 1822 for Britain.
- The two studies differed in survey presentation. The Cardiff survey was administered via computer assisted face-to-face interviews at respondent residences at geographically stratified sampling points in Britain, whereas the Australian survey was administered on-line to panel respondents residing in demographically and geographically stratified areas with particular population centres designated.
- Proportions of male and female respondents were very similar (Australia 47% male, 53% female; UK 48% male, 52% female).
- The age profile of Australian respondents was (15 to 24, 7.8%; 25-54, 60%; 55 plus, 31.6%) with the corresponding profile for British respondents being (15 to 24, 15%; 25-54, 49%; 55 plus, 36%).

What are we finding?

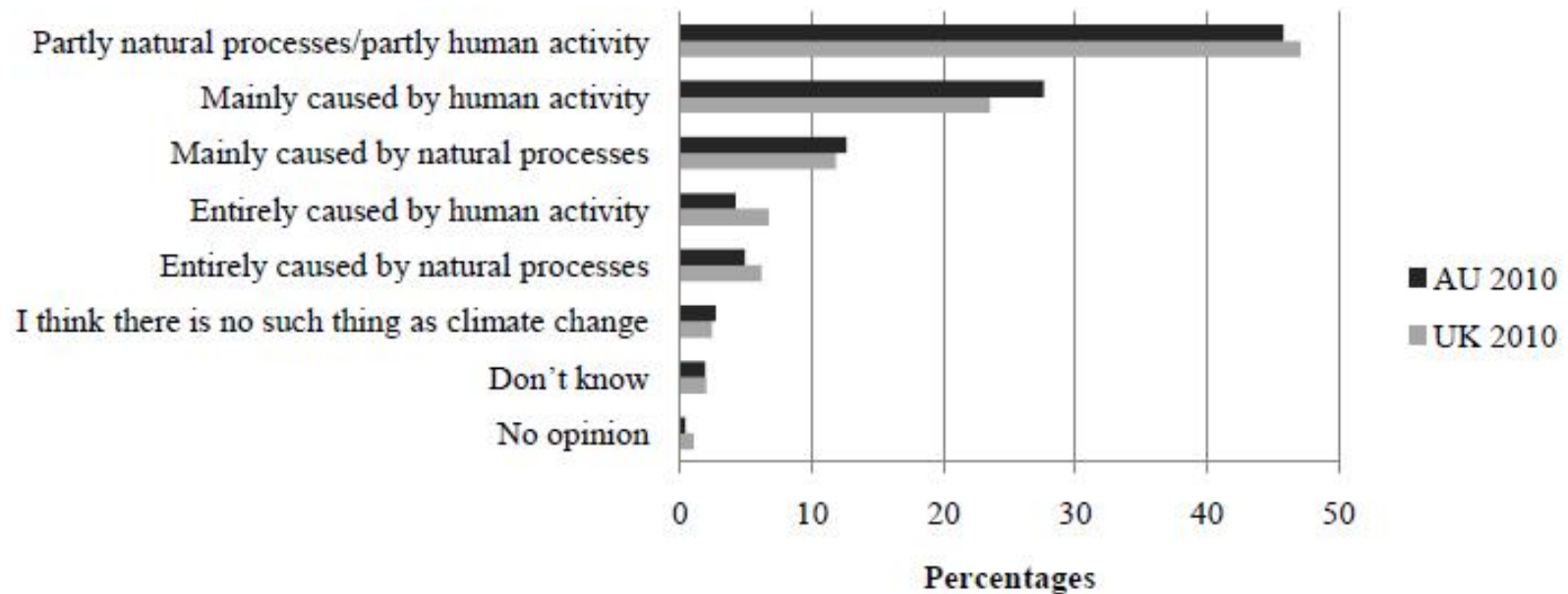
Belief in climate change

As far as you know, do you personally think the world's climate is changing?



Causal attribution

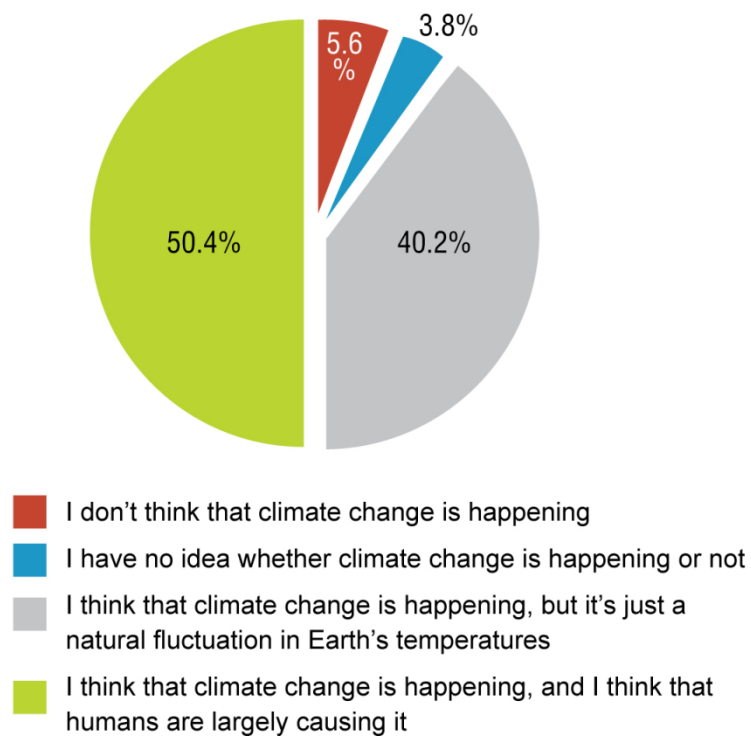
Thinking about the causes of climate change, which of the following best describes your opinion?



CSIRO – Baseline survey of Australian attitudes to climate change

N = 5036 (July/August 2010)

What best describes thoughts about climate change?



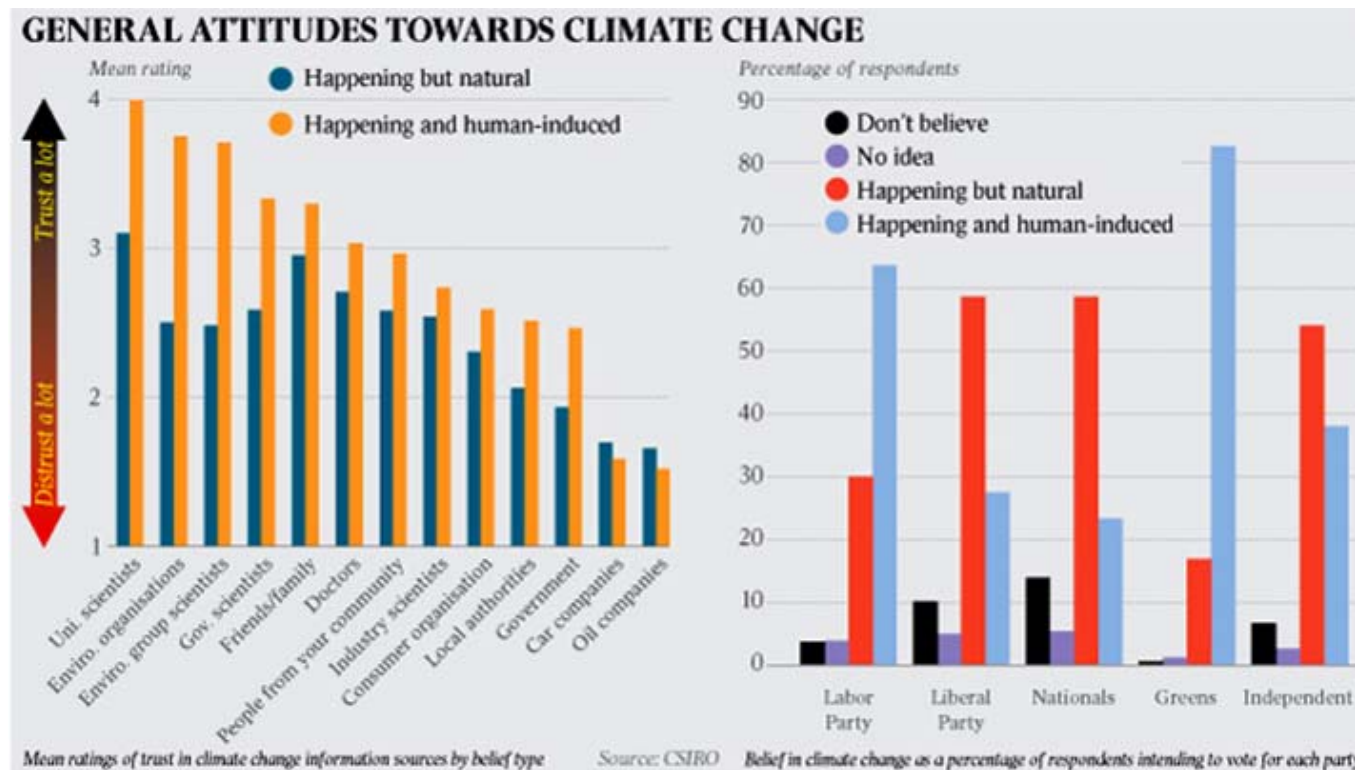


CSIRO – findings

- ‘Responses to this question revealed that just over half thought about climate change as caused by human activities. More than 40% thought of climate change in terms of natural temperature variability. This suggests a lack of consensus regarding the causes of climate change, and a possible polarisation of beliefs’.

Leviston, Z., & Walker, I. A. (2011). *Baseline survey of Australian attitudes to climate change: Preliminary report*. CSIRO.

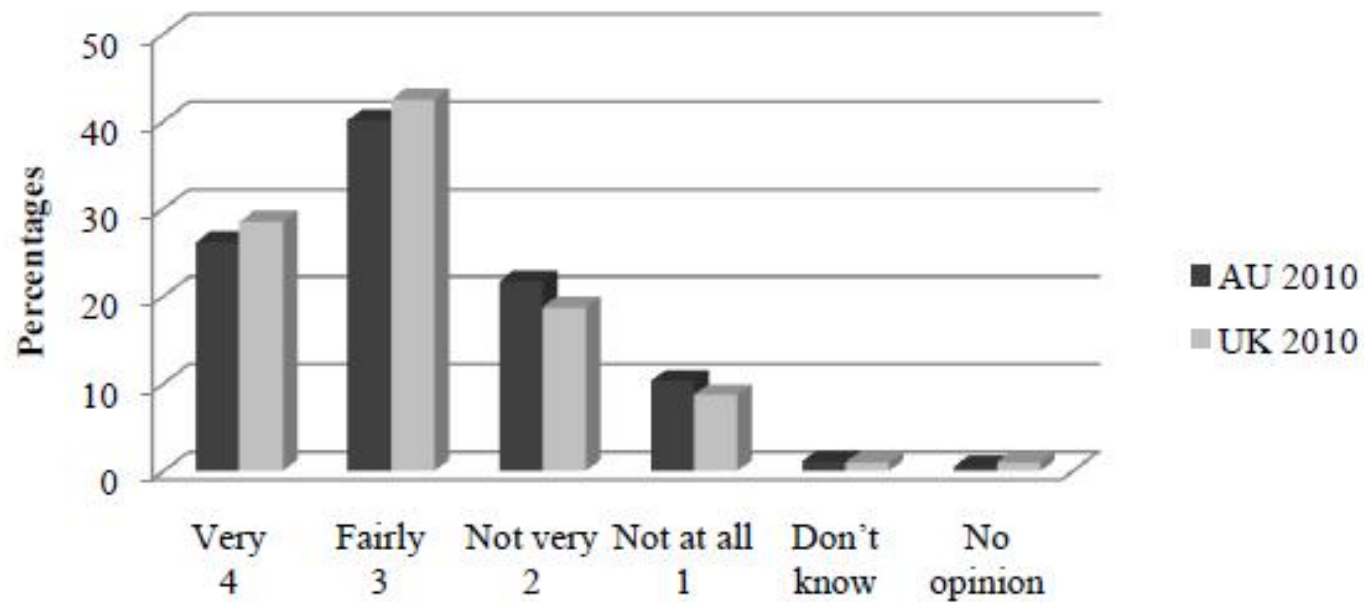
Media release



Jones, C. (2011, April 4). Poor information and sense of irritation hamper climate change science. *The Australian*.

Concern for climate change

How concerned, if at all, are you about climate change, sometimes referred to as 'global warming'?



Belief in climate change

Recent Australian, UK and U.S. selected survey findings addressing views about climate change							
Key Questions	AU – Griffith 2010 N = 3096	AU – CSIRO 2010 N = 5036	AU – Newspoll 2010 N = 1200	AU – Ipsos- Eureka 2010 N = 1050	UK – Cardiff 2010 N = 1822	U.S. – Krosnick 2010 N = 1000	U.S. Leiserowitz 2010 N = 2030
Belief in climate change	As far as you know, do you personally think that the world's climate is changing?	Do you think climate change is happening?	Thinking now about climate change. Do you personally believe or not believe that climate change is currently occurring?	I have serious doubts about whether climate change is occurring	As far as you know, do you personally think that the world's climate is changing?	You may have heard about the idea that the world's temperature may have been going up slowly over the past 100 years. What is your personal opinion on this?	¹ ... What do you think? Do you think global warming is happening?
Response option and results	Yes 73.9% No 18.2% Don't know 7.8%	Yes 82.8% No 17.2%	Yes/believe 73% No/Not believe 22% Uncommitted 4%	*To be advised	Yes 78.3% No 15.3% Don't know 6.4%	Probably been happening 74% Probably not been happening 24% Don't know 2%	Yes 63% No 19% Don't know 19%

Belief in anthropogenic forcing

Recent Australian, UK and U.S. selected survey findings addressing views about climate change							
Key Questions	Griffith 2010 N = 3096	CSIRO 2010 N = 5036	Newspoll 2010 N = 1200	IpsosEureka 2010 N = 1050	UK Cardiff 2010 N = 1822	US Krosnick 2010 N = 1000	US Leiserowitz 2010 N = 2030
Belief in climate change and anthropogenic forcing	Thinking about the causes of climate change (cc), which, if any, of the following best describes your opinion?	Given what you know, which of the following statements best describes your thoughts about climate change?	Do you personally believe that climate change is . . . ? ¹	Which best describes your opinion about the causes of climate change?	Thinking about the causes of climate change, which, if any, of the following best describes your opinion?	(Assuming it's happening) Do you think a rise in the world's temperature is being (would be) caused mostly by things people do, mostly by natural causes, or about equally by things people do and natural causes? ²	Assuming global warming is happening, do you think it is . . .
Response option and results	CC is entirely caused by natural processes 4.9% CC is mainly caused by natural processes 12.6% CC is partly caused by natural, partly by human activity 45.8% CC is mainly caused by human activity 27.6% CC is entirely caused by human activity 4.2% I think there is no such thing as cc 2.7% Don't know 1.9% No opinion 0.4%	I don't think that cc is happening 5.6% I have no idea whether cc is happening or not 3.8% I think that cc is happening, but it's just a natural fluctuation in Earths temperatures 40.2% I think that cc is happening, and I think that humans are largely causing it 50.4%	Entirely caused by human activity 24% Partly caused by human activity 70% Or, do you believe climate change is not caused by human activity at all 5% Uncommitted 1%	CC entirely caused by human activity 10% CC is mainly caused by human activity 26% CC is partly caused by natural processes and partly caused by human activity 41% Climate change is mainly caused by natural processes 9% Climate change is entirely caused by natural processes 5% There is no such thing as cc 3% Don't know 5%	CC is entirely caused by natural processes 5.6% CC is mainly caused by natural processes 12.2% CC is partly caused by natural, partly by human activity 46.3% CC is mainly caused by human activity 24.3% CC is entirely caused by human activity 6.5% I think there is no such thing as cc 2.2% Don't know 2.5% No opinion 0.4%	Things people do 30% Natural causes 25% Both equally 45%	Caused mostly by human activities 50% Caused by both human activities and natural changes 6% Caused mostly by natural changes in the environment 35% None of the above because global warming isn't happening 7% Other 2% Don't know 1%
³ Belief in human forcing -Summary	90.2%	50.4%	94%	86%	89.3%	75%	91%

Concern and climate change

Recent Australian, UK and U.S. selected survey findings addressing views about climate change							
Key Questions	AU – Griffith 2010 N = 3096	AU – CSIRO 2010 N = 5036	AU – Newspoll 2010 N = 1200	AU – Ipsos- Eureka 2010 N = 1050	UK – Cardiff 2010 N = 1822	U.S. – Krosnick 2010 N = 1000	U.S. Leiserowitz 2010 N = 2030
Concern for climate change	How concerned, it at all, are you about climate change, sometimes referred to as 'global warming'?	How worried are you about climate change?	-	-	How concerned, it at all, are you about climate change, sometimes referred to as 'global warming'?	-	How worried are you about global warming?
Response option and results	Very concerned 26.2% Fairly concerned 40.1% Not very concerned 21.7% Not at all concerned 10.3% Don't know 1.1% No opinion 0.5%	¹ Very worried 20% Somewhat worried 45% Not very worried 23% Not at all worried 12%	-	-	Very concerned 28.5% Fairly concerned 42.5% Not very concerned 18.7% Not at all concerned 8.7% Don't know 0.9% No opinion 0.8%	-	Very worried 16% Somewhat worried 39% Not very worried 26% Not at all worried 19%

Disbelief and scepticism

Table 1. Relative findings from differing items relating to beliefs concerning 'climate change'.³

Q8. As far as you know, do you personally think the world's climate is changing?		
	Australia %	Great Britain %
Yes	73.9	78.3
No	18.2	15.3
Don't know	7.8	6.4

Q12a. To what extent do you agree or disagree with each of the following statements about climate change?								
		Strongly agree %	Tend to agree %	Neither agree nor disagree %	Tend to disagree %	Strongly disagree %	No opinion %	Don't know %
*I am <u>certain</u> that climate change is really happening	Australia	30.8	40.6	12.2	10.1	4.7	0.3	1.2
	GB	24.0	35.0	12.0	22.0	6.0	0.8	0.4

Note. * The British survey framed this item as 'uncertain' rather than 'certain', hence the scale percentages have been reversed to align with Australian results.

Q9. Thinking about the causes of climate change, which, if any, of the following best describes your opinion?

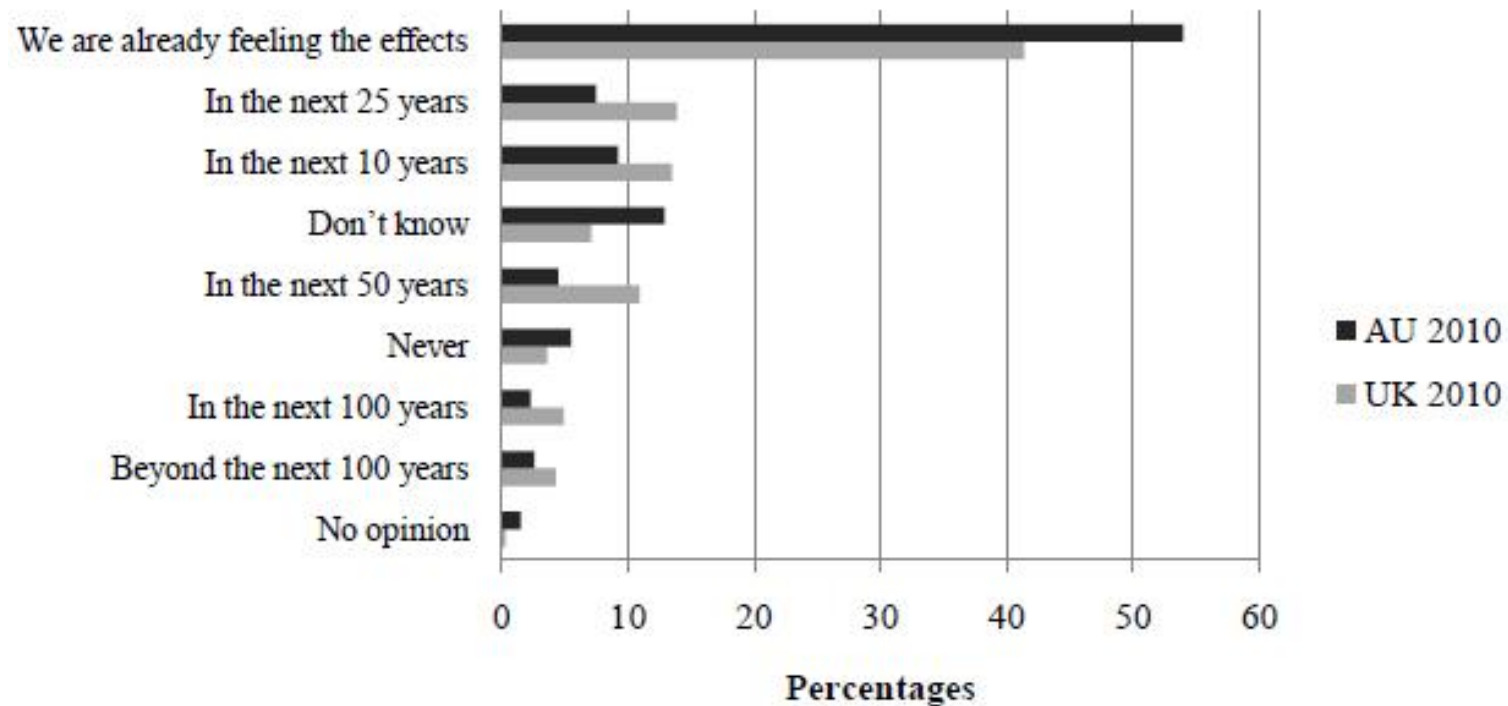
	Australia %	GB %
a) Climate change is entirely caused by natural processes	4.9	5.6
b) Climate change is mainly caused by natural processes	12.6	12.2
c) Climate change is partly caused by natural processes and partly by human activity	45.8	46.3
d) Climate change is mainly caused by human activity	27.6	24.3
e) Climate change is entirely caused by human activity	4.2	6.5
f) I think there is no such thing as climate change	2.7	2.2
g) Don't know	1.9	2.5
h) No opinion	0.4	0.4

Q14. When, if at all, do you think Australia/Britain will start feeling the effects of climate change?

	Australia %	GB %
We are already feeling the effects	54.0	41.4
In the next 10 years	9.2	13.5
In the next 25 years	7.5	13.9
In the next 50 years	4.5	10.9
In the next 100 years	2.3	4.9
Beyond the next 100 years	2.6	4.3
Never	5.5	3.6
Don't know	12.9	7.1
No opinion	1.5	0.3

Direct effects of climate change

When, if at all, do you think Australia/Great Britain will start feeling the effects of climate change?





How did we explore natural disasters and climate change?

- Rating of concern about– environmental threats, additional issues and threats along with natural disasters and impacts of climate change
- Direct experience with climate change (local/global)
- Perceived inter linkages between climate change and intensity of weather events (e.g., storms, droughts)
- Direct experience with natural disasters and quantification and categorisation of the nature of these events and associated experience
- Property damage, anxiety and stress, subjective vulnerability with respect to the disaster event
- Open-ended items

Climate change and natural disasters

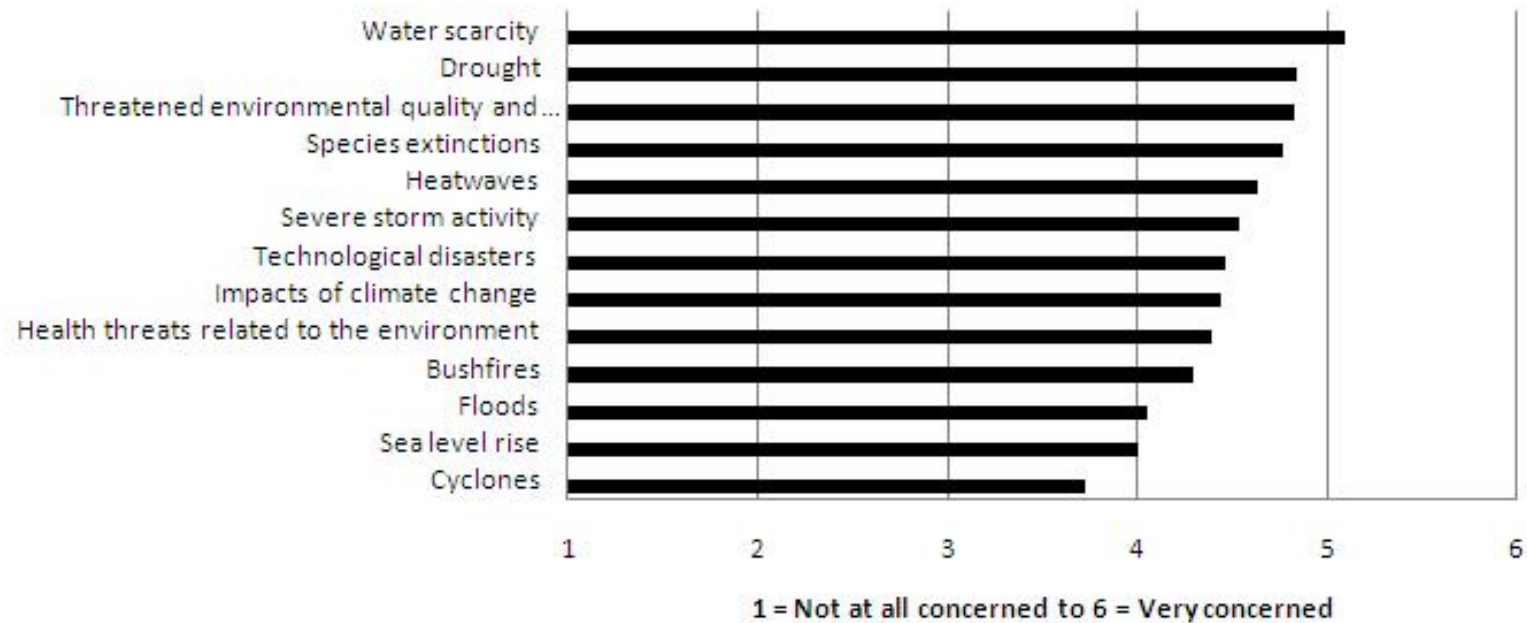
Q51. Overall, how much do you think climate change is influencing the frequency and intensity of weather events like storms and droughts?

	%	<i>M</i>
A good deal (6)	19.3	4.14
	28.6	
	22.9	
	11.5	
	10.9	
Not at all (1)	6.8	

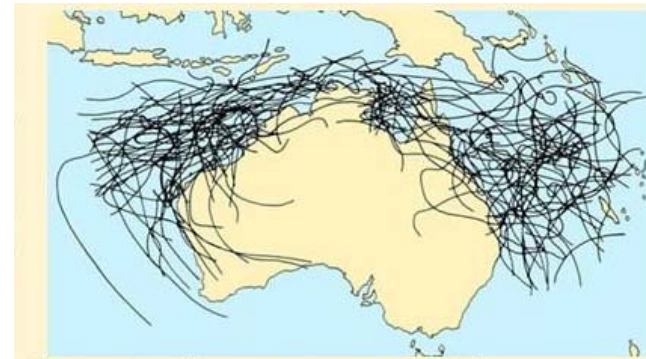


Post hoc -Rank ordering of environmental threats

How concerned are you that each of the following environmental threats might directly affect you, your family, or you local environment in the foreseeable future?

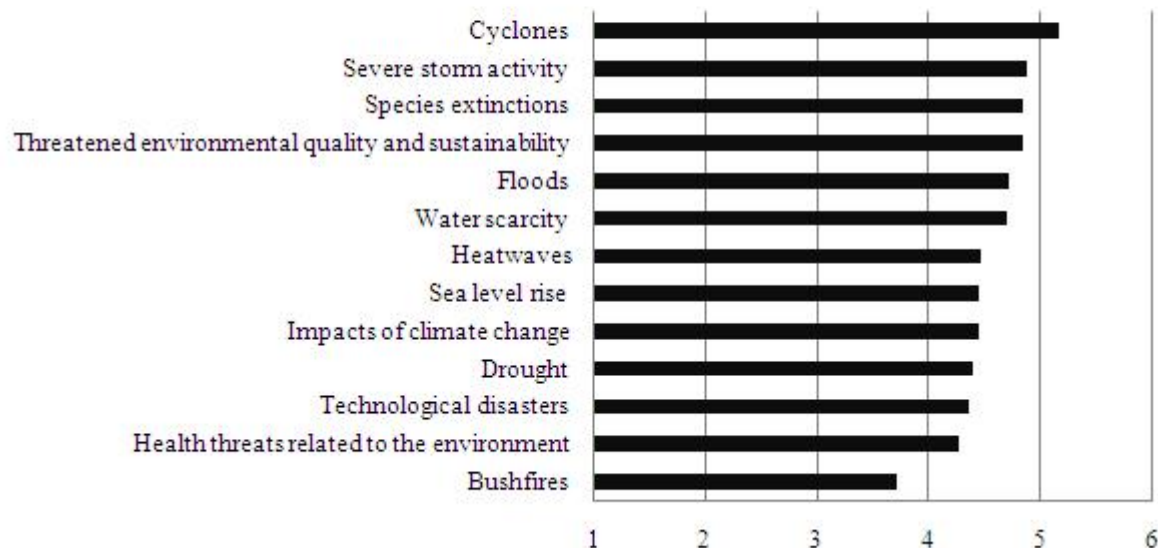


Rank ordering of environmental threats in QLD, WA, & NT



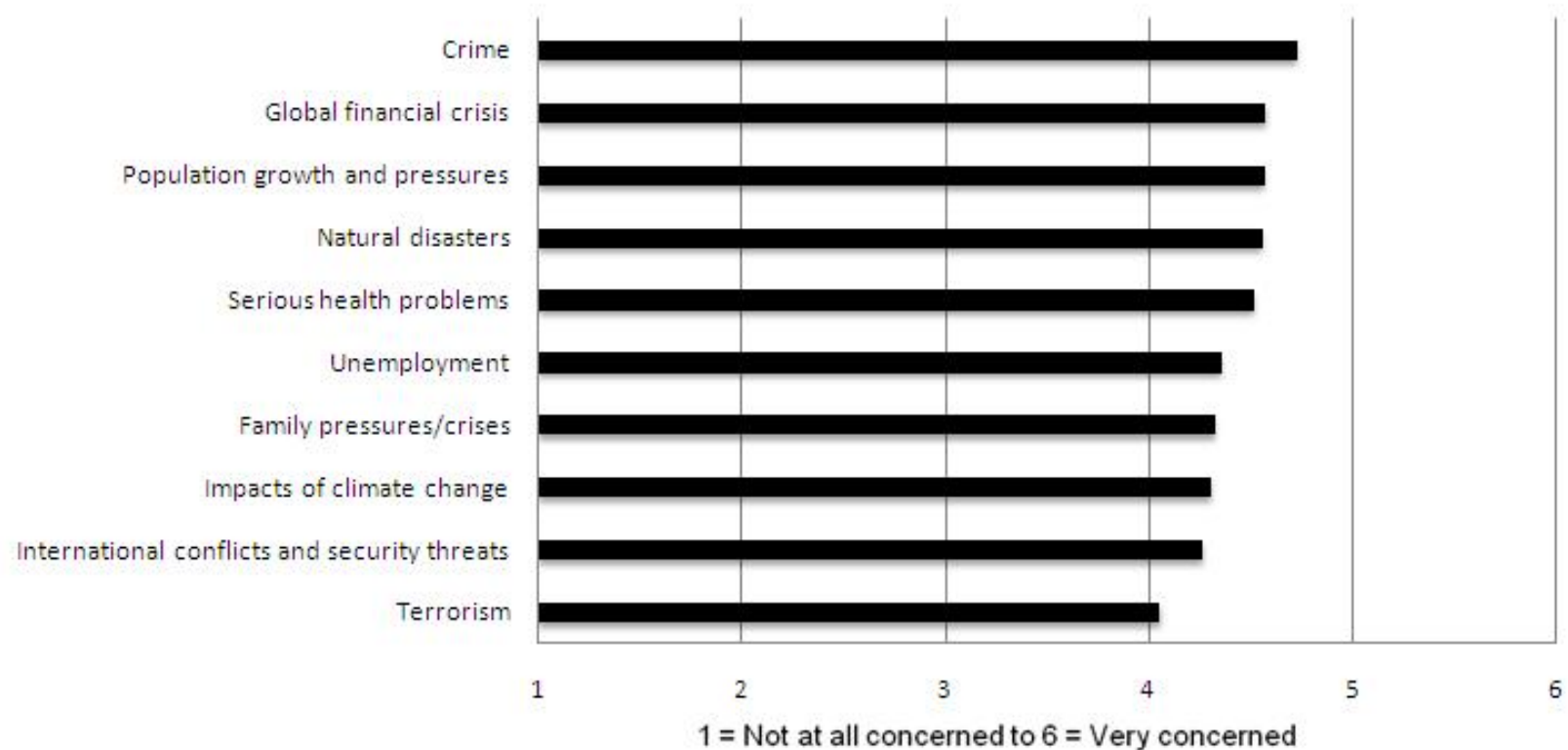
The most cyclone prone areas include Queensland, Western Australia and the Northern Territory

How concerned are you that each of the following environmental threats might directly affect you, your family, or you local environment in the foreseeable future?
Cyclone prone areas: Townsville, Cairns (QLD), Darwin (NT) and Broome (WA)



Rank ordering of additional threats and issues

How concerned are you that each of the additional issues and threats may adversely affect you or your family in the foreseeable future?





Qualitative findings

Direct experience and perceptions relating to climate change and natural disasters

Question:

Have you experienced any noteworthy changes or events in your local natural environment over the past ten years which you think might be due to climate change?

Results:


35.7% agreed that they had experienced noteworthy changes or events in their *local* natural environment due to climatic changes.

24.5% of respondents had directly experienced environmental changes and events taking place *elsewhere in Australia or the world*.



What are these changes and events?

- Whilst Australia has always been a country of extremes in regard to climate I think there has been an increase in extreme weather conditions over the past several years - more wild weather and prolonged severe drought than I can recall from my earlier years (Sydney, metro, NSW).
- Last year my house was inundated with a flood, which happens only rarely, however we have had five warnings of floods since then, as the river system is built up with debris from the impact of people building around it - also more topsoil came down due to degradation from new forms of farming (Port Macquarie, NSW).
- There are a lot more trees dying. / We are unable to water gardens consistently due to water restrictions. / The local creeks don't flow for long even after heavy rain. / In my backyard, the ground is beginning to open up exposing large cracks...due mainly to drought like conditions and no moisture in the soil (Adelaide, metro, SA).

- 
- When I first moved to this area (1960's) you could rely on the weather to dictate when you would do things (holidays etc) now it's all over the shop. Less cyclones have been noted also. Mostly the bad weather areas are now south in Australia (Cairns, QLD).
 - The Barrier Reef has changed so much. When I was a child the colours that come from the reef were spectacular. So much of it has died off (Brisbane, QLD).
 - Erratic weather. Extremes of heat and cold. Small earthquakes have become a common event (Melbourne, metro, VIC).
 - Drought. In my home town there are lakes that have dried up that we used to swim and boat in when I was a child. There is not much grass and what there is, is harsher. Gardens, what ones there are, are different, there are more low water gardens. Kids can't play under sprinklers or have backyard pools. you don't see people washing cars on the nature strip or front lawn because of water restrictions. There whole place just feels a lot less lush and living seems harder (Melbourne, metro, VIC).
 - We were victims of the Black Saturday bushfires. I feel that climate change had affected the local environment and was partly responsible i.e. lack of rain, extreme temperatures (Melbourne, metro, VIC).

Number of times respondents experienced a natural disaster event

Q53. If yes, please indicate the type of event(s) and the approximate number of times you may have experienced such an event?

	Cyclone		Bushfire		Drought		Flood		Other (please specify)	
	Frequency	%	Frequency	%	Frequency	%	Frequency	%	Frequency	%
Experienced the event on one occasion	233	7.5	283	9.1	193	6.2	222	7.2	108	3.5
Experienced the event twice	170	5.5	167	5.4	134	4.3	162	5.2	43	1.4
Experienced the event three times	87	2.8	55	1.8	84	2.7	73	2.4	16	0.5
Experienced the event four times	37	1.2	13	0.4	21	0.7	33	1.1	4	0.1
Experienced the event five times or more	132	4.3	75	2.4	103	3.3	131	4.2	15	0.5

Stress, subjective and objective exposure, and vulnerability

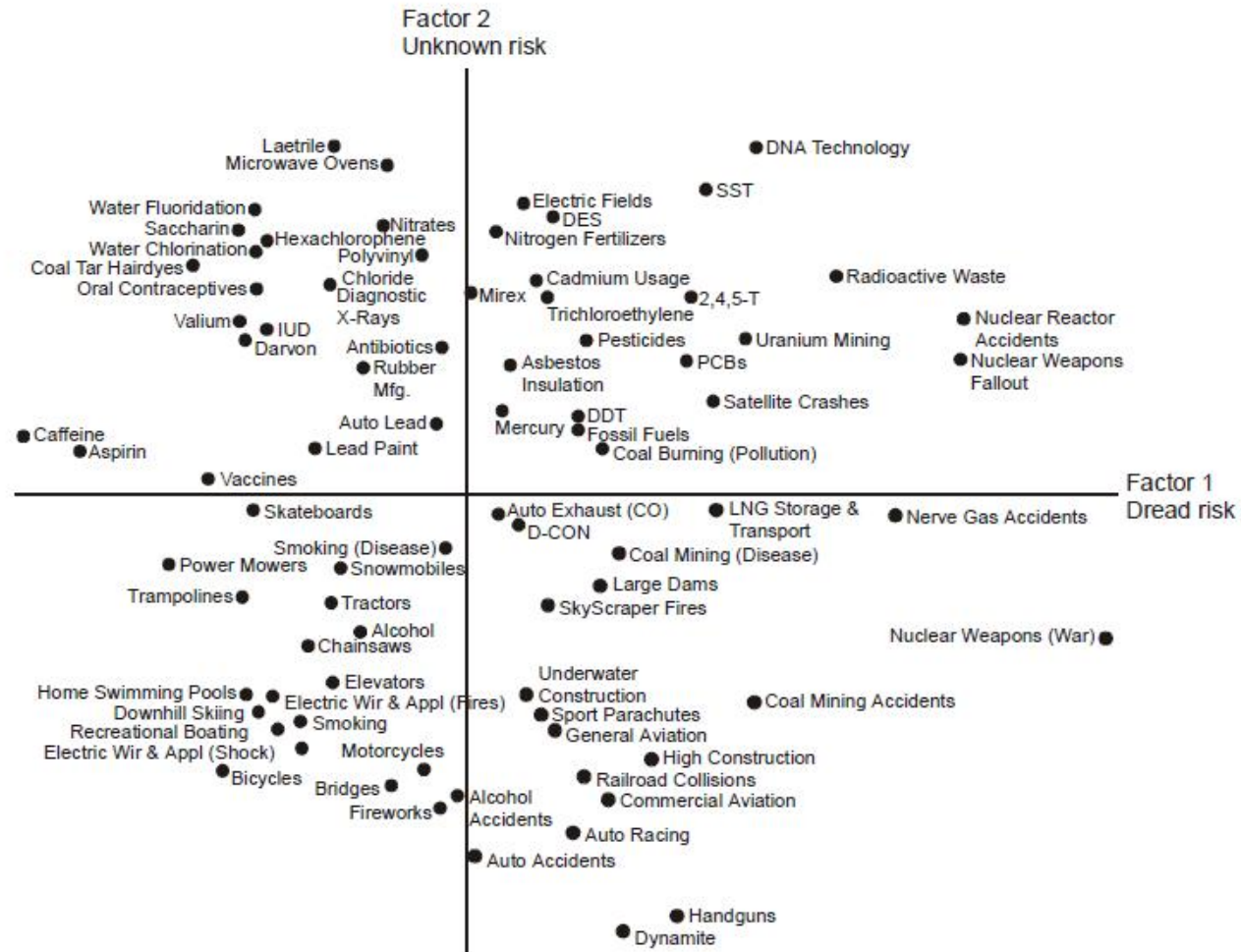
Q55. Overall how much anxiety and stress did you experience in this or these situations?

	%	<i>M</i>
Considerable stress (6)	7.0	4.12
	10.8	
	7.9	
	5.4	
	4.2	
No stress (1)	2.1	
Not applicable	62.6	

Q56. How vulnerable do you think the region where you live is to natural disasters (e.g., floods, droughts, cyclones, and bushfires)?

	%	<i>M</i>
Very vulnerable (6)	15.0	3.78
	22.5	
	22.2	
	13.9	
	18.2	
Not vulnerable (1)	8.2	

MDS – Slovic, Fischhoff & Lichtenstein



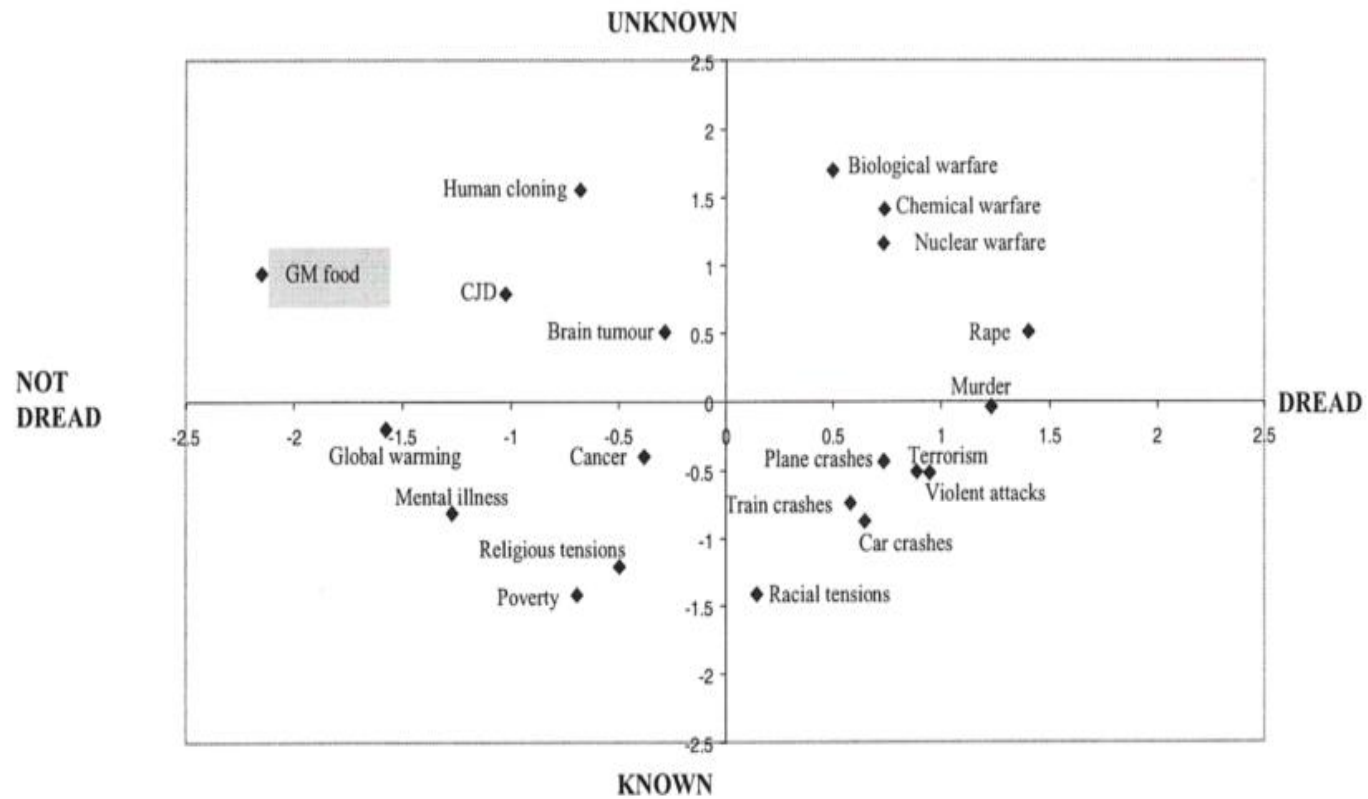
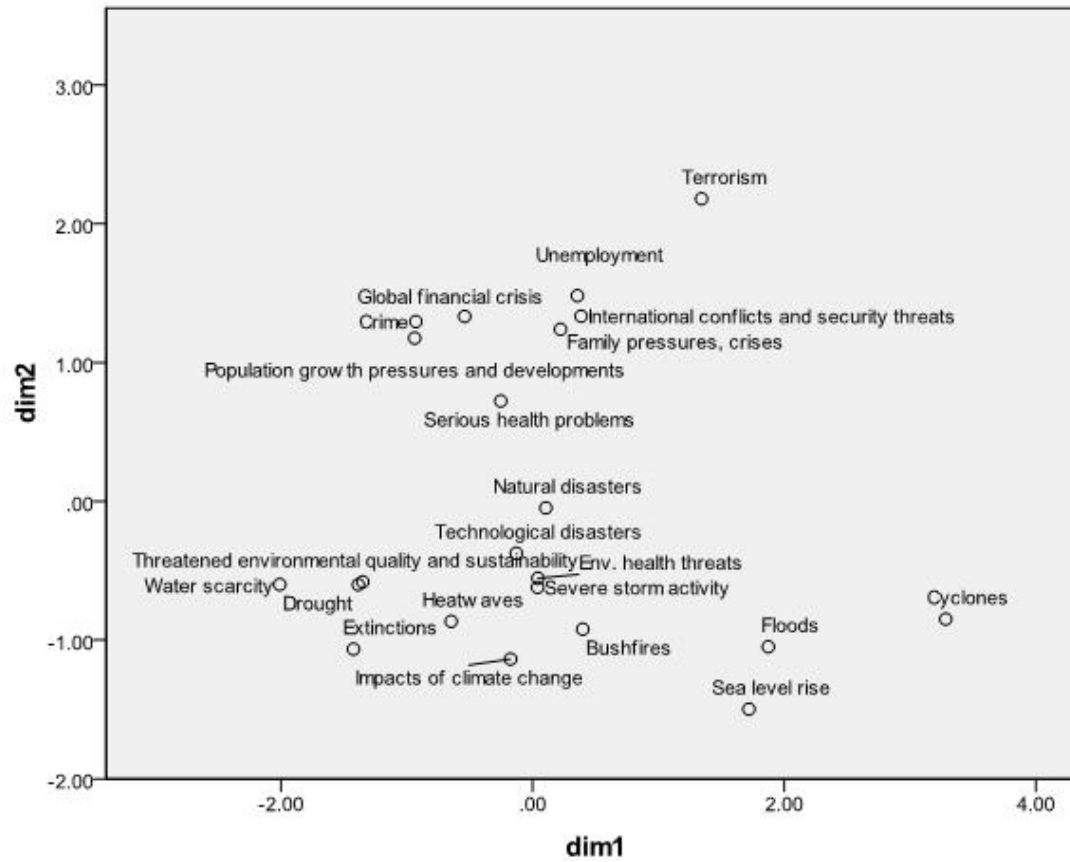
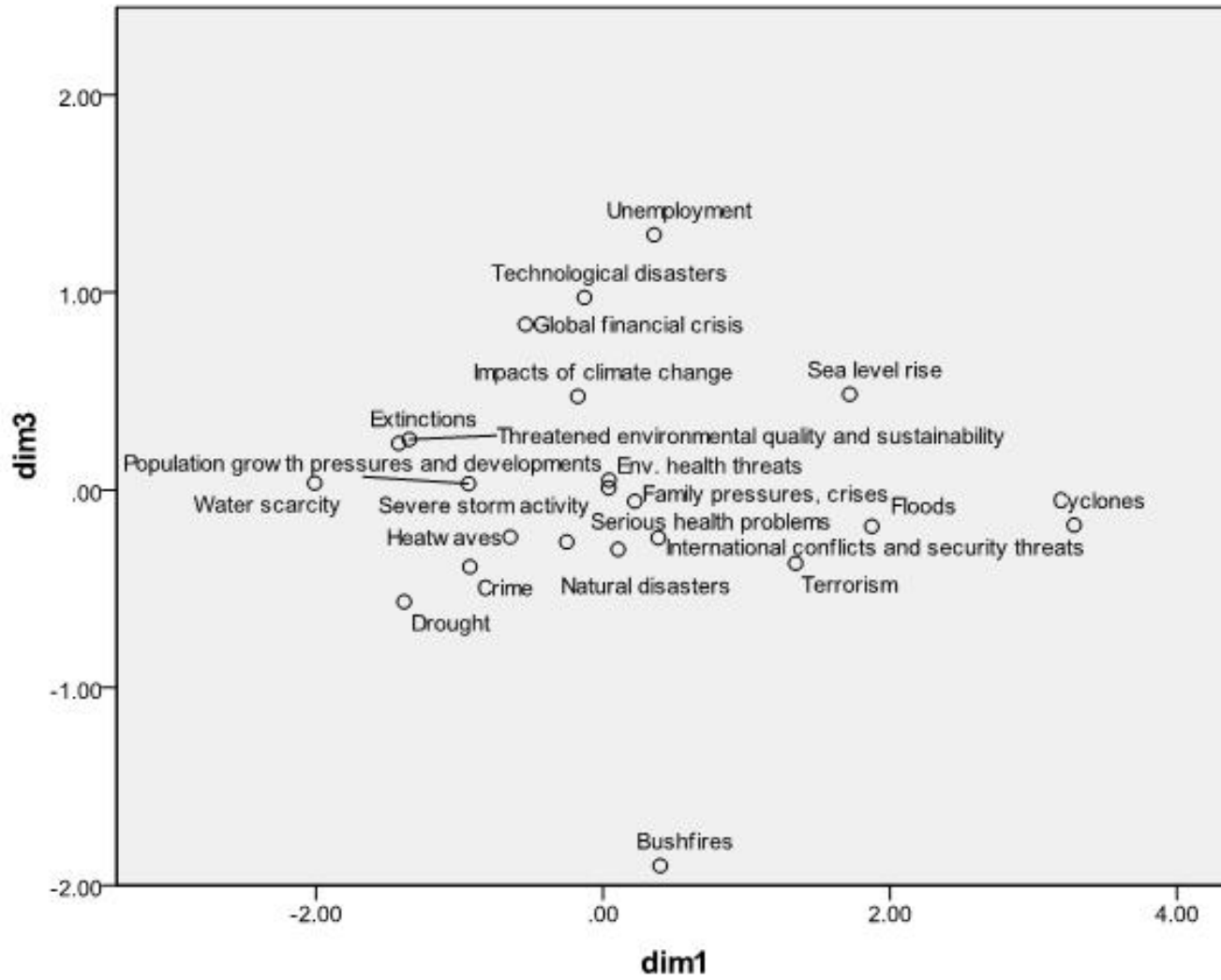
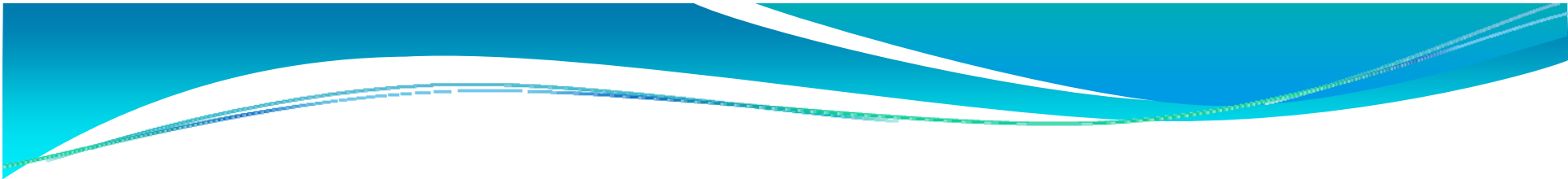


Fig. 3. Plot of factor scores (based on mean ratings for all participants) showing location of GM food in relation to other concepts on the “dread” and “unknown” factors.

MDS – Australian national survey findings





Distress

Q43. Please indicate the extent to which each of the following statements reflects you own response to the threat of climate change.

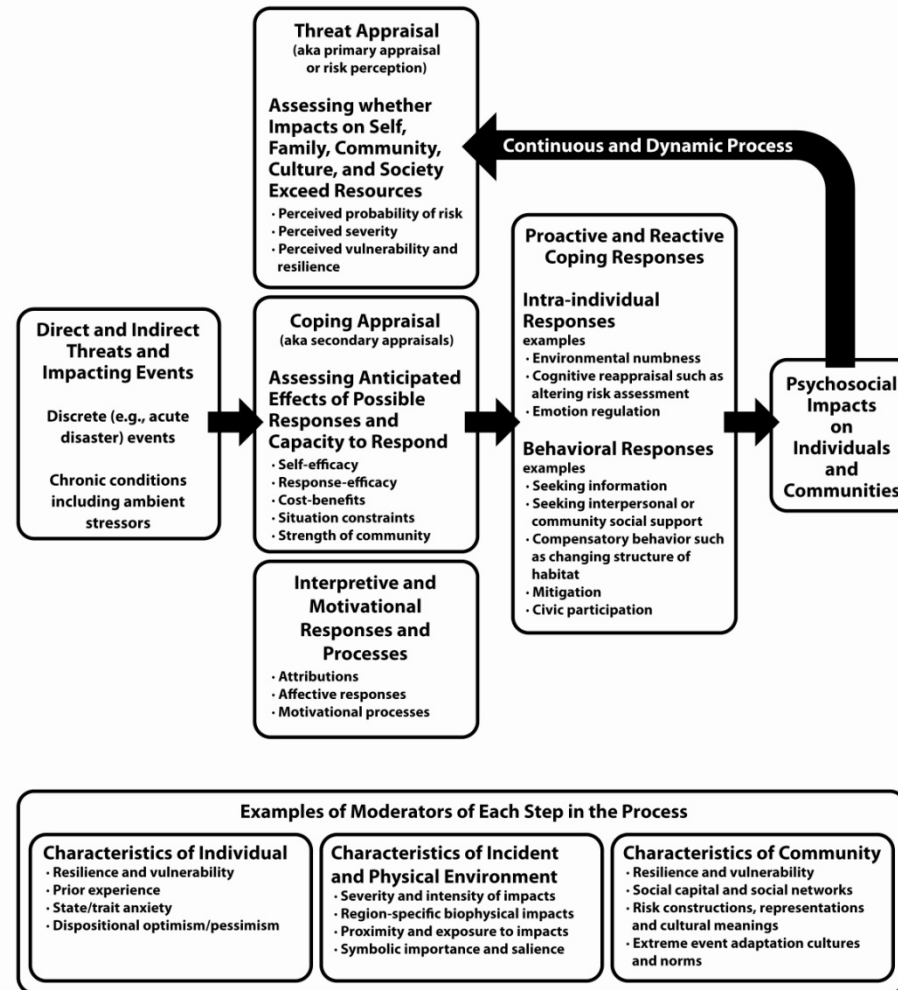
	6.Strongly agree					1.Strongly disagree		<i>M</i>
	%	%	%	%	%	%		
I experience some distress each time I see or read media coverage of the likely impacts and consequences of climate change	5.6	18.0	27.6	17.7	19.2	11.9	3.37	
At times I find myself thinking and worrying about what the world will really be like for future generations because of climate change	12.9	24.7	22.9	13.9	14.5	11.1	3.74	
I experience some guilt over the fact that my family and friends' lifestyles and consumption patterns are in part responsible for the unfolding impacts of climate change	5.1	16.4	22.7	18.9	19.9	16.9	3.17	
It upsets me that there seems to be so little that I can do to address environmental problems such as climate change	6.0	16.8	26.3	20.3	17.8	12.9	3.34	
At times I feel some personal responsibility for the problems and unfolding impacts of climate change	2.8	9.4	21.4	19.9	23.8	22.6	2.79	
The threat of climate change is affecting my quality of life and my assessment of environmental quality more generally	1.7	7.7	19.2	23.1	27.3	21.1	2.70	
I feel some sense of loss because of climate change impacts that are becoming apparant in my local area	3.1	9.0	18.0	22.9	26.4	20.7	2.77	

Adaptation

Q45. Please indicate the extent to which each of the following statements best describes your own response to the threat of climate change.

	6.Strongly agree					1.Strongly disagree
	%	%	%	%	%	%
I have changed the way I think about the seriousness of environmental problems because of climate change	7.4	23.5	26.4	16.8	15.8	10.1
Increasingly I find myself less likely to attend to media reports, articles and discussions about the nature or impacts of climate change	8.2	17.7	22.9	23.2	19.2	8.7
I have seriously thought about alternative places to live because of the increasingly evident impacts of climate change	4.0	7.0	10.2	11.0	25.5	42.2
Climate change has forced me to change the way I think about and view how we live in and use our natural environment in Australia	9.0	22.0	24.7	14.3	16.6	13.2
I have often discussed my thoughts and feelings about climate change with others over the past several years	11.1	22.3	20.6	15.1	17.9	13.0
I tend to think differently these days about what is acceptable and sustainable and not acceptable with respect to consumer produces and packaging, and consumption in general	18.0	31.0	23.8	12.2	8.9	6.0
When considering the challenges of climate change it is important to look for things that I can address and change in my everyday life	18.8	30.4	23.7	12.6	7.9	6.7

Psychological Processes that Influence Adaptation to and Coping with Climate Change



Antecedents of Climate Change Behaviours

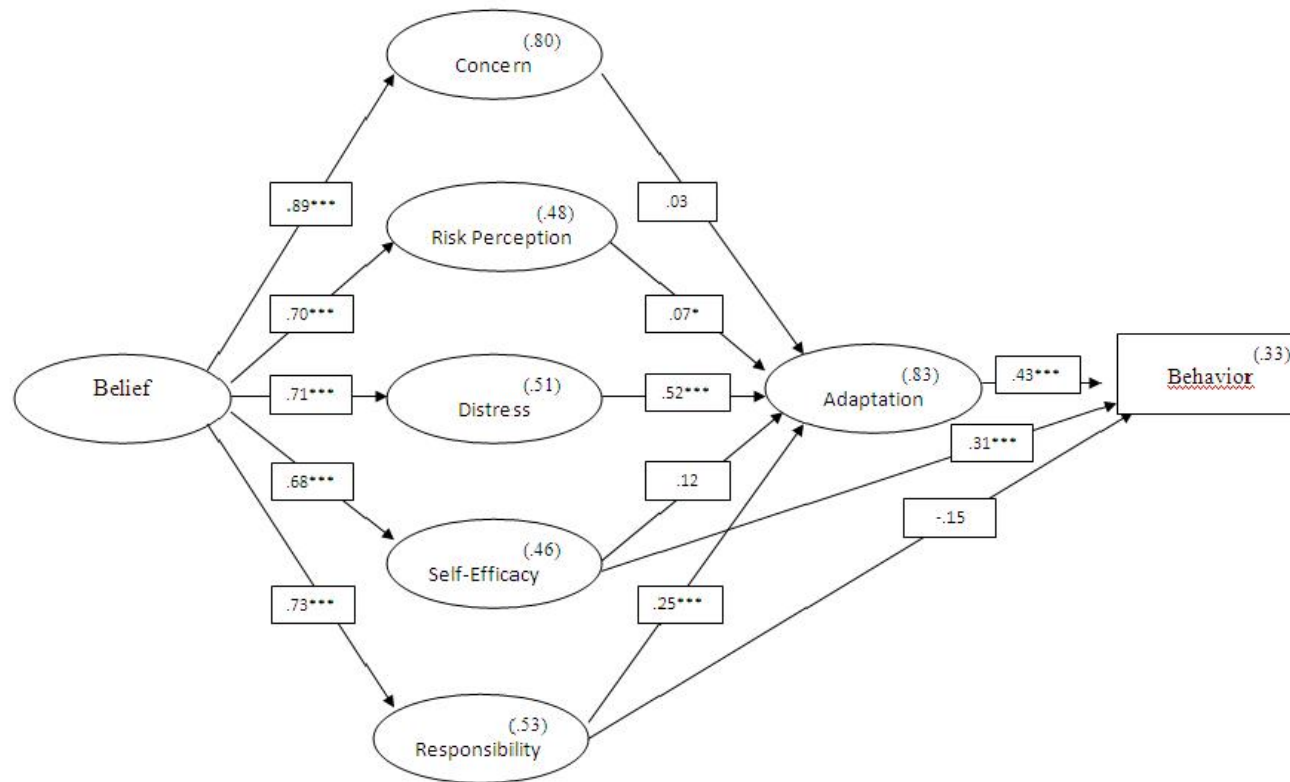


Figure 2. Model 2: Hypothesised Model of Antecedents of Climate Change Behaviours
 (Standardised parameter estimates on arrow-head lines, *** $p < .001$. * $p < .05$; percentage of variance explained, in parentheses, in spheres)

Ongoing analyses:

CC Variable	Gender		Age (in years)			Income (household \$000 p.a.)		
	M	F	< 40	40 - 54	55+	<\$60	\$60- \$100	> \$100
<i>N</i> ≤			819	130	976	1345	955	730
Residential Exposure	10.2	11.1 ***	10.5 b	10.9 ***	10.4 b	10.9 ***	10.6	10.3 a
Lifestyle Expos.	15.0	15.1	14.1 b	15.3	15.6 ***	15.7 ***	14.8 b	14.2 a
Prior Adv. Exp.	6.6	6.6	6.1 b	6.7	6.9 ***	6.7	6.5	6.5
Connection to Nature	24.7	26.1 ***	24.5 b	25.7	25.9 ***	26.1 ***	25.3 b	24.7 b
Trust	11.6	12.4 ***	12.8 ***	12.0 b	11.5 a	12.2	12.0	11.9
Objective Knowledge	2.6	2.8 *	3.1 ***	2.7 b	2.4 a	2.7	2.7	2.8
Subjective Knowledge	4.2 ***	4.0	4.0 b	4.1	4.2 **	4.1	4.1	4.1
Biospheric	20.9	23.1 ***	21.9 b	22.6 ***	21.5 b	22.3	22.0	21.7
Altruistic	20.5	22.8 ***	22.2 ***	22.1	20.8 a	21.8	21.8	21.6
Egoistic	18.6	20.6 ***	20.5 ***	20.0 b	18.5 a	19.7	19.8	19.6
Green identity	9.7	10.5 ***	10.0 b	10.3 *	10.1 b	10.4 ***	10.1 b	9.9 b
Media Exposure	1.6 **	1.4	1.5	1.5	1.5	1.5	1.5	1.4
Belief	15.2	16.5 ***	16.5 ***	16.1 b	15.1 a	15.8	16.0	16.0
Importance	3.9	4.4 ***	4.2 ***	4.2	4.0 b	4.2	4.1	4.1
Concern	22.0	24.5 ***	24.3 ***	23.8	22.0 a	23.4	23.5	23.2
Risk Perception	18.0	19.8 ***	19.8 ***	19.2 b	17.8 a	19.2 *	19.0	18.5 a
Distress	20.7	23.0 ***	23.2 ***	22.3 b	20.3 a	22.2	22.0	21.6
Self-efficacy	17.4	19.2 ***	18.8 ***	18.6	17.7 b	18.5	18.4	18.2
Personal responsibility	12.1	13.3 ***	13.1 ***	12.8 b	12.2 a	12.7	12.6	12.8
Adaptation	27.6	29.6 ***	28.4	29.2 *	28.1 b	28.9	28.6	28.5
Behaviours	6.2	6.6 ***	6.1 a	6.4	6.6 **	6.7 ***	6.2 b	6.1 b

Vulnerability and resilience, objective and subjective exposure

PSYCHOLOGICAL ADAPTATION AND RESILIENCE IN THE CONTEXT OF CLIMATE CHANGE: CRUCIAL BUT NEGLECTED CONSTRUCTS AND PROCESSES

Joseph P. Reser, Griffith University, Queensland, Australia

What comes before and mediates climate change adaptation and resilience? Knowledge and beliefs, prior experiences, risk perceptions and appraisals, environmental awareness and concern, values and responsibility attributions, self-efficacy, self-efficacy, competence and anticipatory coping? Are these factors being adequately considered and addressed by climate change science or policy makers?

THIS WILL BE TERRIFYING

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Bring psychology and climate change science 'in from the cold' and into climate change science

The constructs 'adaptation' and 'resilience' have been translocated constructs within psychology and the social and health sciences for the past century. In this history, one, and body of work within psychology and the broader health and social sciences is often little known or mentioned in climate change science and policy contexts.

'Adaptation', 'resilience', 'vulnerability' along with other associated constructs and terms have been borrowed and re-appropriated by the IPCC and Climate Change Science as the basis of a very selective drawing from the social sciences and humanities, and past empirical evidence in evidence of use and preferred levels of analysis in the present and physical sciences.

These constructs of use and meaning within the IPCC and within those disciplines represented within the IPCC and the climate change science community have effectively ignored and marginalized critically relevant bodies of theoretical work and research findings relating to adaptation and resilience at individual and psychological levels of analysis.

There is a critical need for cross-disciplinary conceptual and methodological transparency and tools which foster more accurate and meaningful measurement and documentation of important changes and processes in the context of climate change.

Psychology is a bridging discipline across the natural and social science disciplines, with a particularly valuable role in the interdisciplinary, processes and assessment for the collaborative documentation, monitoring and addressing of changes and impacts in the human landscape associated with climate change.

Psychological adaptation and resilience are two notable examples, with these psychological processes largely neglecting behavioral adaptation and change, and adaptive capacity at individual and community levels.

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MEDIATING REPRESENTATIONS OF 'CLIMATE CHANGE'

What are the implications and dividends of a more serious consideration of psychological adaptation and resilience constructs and processes?

- An appreciation that considerable adaptation to the threat and unfolding impacts of climate change is taking place with respect to changes and adjustments in how individuals and communities are perceiving and understanding, thinking and feeling, and psychologically responding to this threat and risk domain.
- An identification of the need to harness and monitor these into individual level changes and adjustments that are taking place within the human landscape in response to climate change.
- A heightened appreciation of the interlinkages between psychological responses to the climate change threat and unfolding environmental impacts (i.e., including psychological adaptation) and overall behavioral adaptation and mitigation outcomes.
- A realization that an individual's exposure to and experience with the threat and unfolding environmental impacts of climate change are of central importance to psychological responses and that this exposure, by most people, is currently through media coverage and representation, including risk responses and appraisals, behavior, threat, and fear, and psychologically distress, paralysis and inactivity.
- An appreciation that the human impacts of climate change extend to and encompass the psychological impact of both the media-mediated threat of global climate change and directly perceived or experienced biophysical environmental impacts of climate change, with these psychological processes and behavior influencing behavioral responses and beyond. Furthermore, monitoring behavioral responses in terms of event adaptation and risk policy actions.
- A bridging introduction from the importance of the need to the both an individual perspective of climate change (i.e., including psychological adaptation) and overall behavioral adaptation and mitigation outcomes, and the need for behavioral adaptation and mitigation which address not only necessary lifestyle and consumption actions and preventive measures, but necessary changes in how human-mediated environmental, socio-cultural and institutional responses to climate change are being perceived and monitored. Furthermore, an individualized and community-level response to climate change.

vulnerability social

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SCIENTIFIC EXPERTS

Bring psychology and climate change science 'in from the cold' and into climate change science

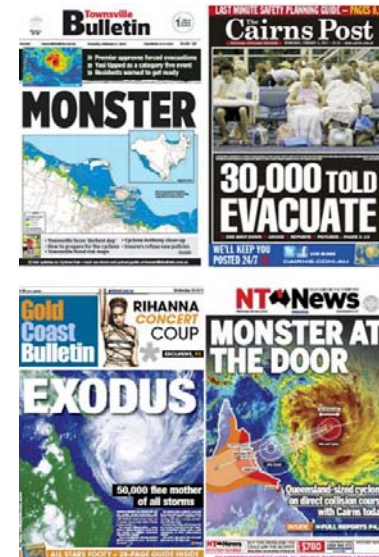
Some interesting media within psychology has largely pertained to such acids, tornadoes, and personal threats and disasters. How can we help our readers, students, authors, and clinicians to more adequately address the ongoing nature of the climate change threat, an background and chronic environmental change?

What comes before and mediates climate change adaptation and resilience? Knowledge and beliefs, prior experiences, risk perceptions and appraisals, environmental awareness and concern, values and responsibility attributions, self-efficacy, self-efficacy, competence and anticipatory coping? Are these factors being adequately considered and addressed by climate change science or policy makers?

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- Current psychological and social impacts of global climate change are largely the product of individual and societal encounters with media coverage and representations of the threat and reported unfolding environmental changes and impacts of climate change elsewhere in the world. How might this alter how we conceptualise and address psychological adaptation and resilience to climate change?
- Stress and coping models within psychology are largely premised on more acute, immediate, and personal threats and stressors. How can we adapt our models, measures, advice, and interventions to more adequately address the ongoing nature of the climate change threat, as background and chronic environmental stressor?



Brace for more extremes - climate experts warn after Queensland floods and Cyclone Yasi

By Robert Burton-Bradley | news.com.au | April 05, 2011 6:19pm

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Townsville during Cyclone Yasi: Scientists say we should prepare for less cyclones but possibly more severe ones in the future. Picture: Adam Head



Concluding observations

- We need to look more seriously at the nature of public **understandings** of this phenomenon and threat as distinct from public attitudes toward or knowledge of climate change science if we are to meaningfully engage with the public.
- The psychological and social impacts of **the threat** of climate change have been occurring for some time now as evidenced in high levels of concern and appreciable distress.

- **Psychological adaptation** and adjustment to the ongoing stress of the threat of climate change and its consequences has been a much neglected component of the climate change challenge, and a crucial mediator of individual and community behavioural change.
- **Changes and impacts** taking place in the human landscape in the context of climate change are as important as physical environmental changes and impacts and require far more serious consideration and assessment
- There is a very strong nexus between climate change and natural disasters/extreme weather events in public risk perceptions and understandings which has multiple implications for more effective preparedness and adaptation measures and policies



History effects July 2010 – April 2011

Natural disasters and extreme weather events in Australia July 2010 – April 2011					
Australia (2010) overall had its wettest spring and third wettest year on record.					
Date	Location	Event	People killed	People affected	Property impacts
Feb 2011	Ayr, Cairns, Townsville, Qld (Multiple locations)	Cyclone <u>Yasi</u> (Category 5)	1	10,000	1,000 homes damaged
Feb 2011	Melbourne, Vic <i>More than 65% of Vic recorded daily rainfall totals in the 99th percentile for Feb 4-5th.</i>	Severe storm	1	90 people affected, 6,000 people evacuated	20 buildings damaged
Feb 2011	Perth, WA (multiple locations)	Bushfires	-	4 people injured	72 homes destroyed, 32 houses damaged
Jan 2011	Victoria (Multiple locations) <i>Record rainfall West and North-West Vic 13 – 14th Jan</i>	Floods	-	5,000 people affected	To be advised
Jan 2011	Bowen, Qld	Cyclone Anthony (Category 2)	-	-	-
Dec 2010	Gascoyne River, WA (Many locations broke their highest annual daily rainfall records)	Flood	-	Several towns evacuated	Crops destroyed, cattle drowned. Widespread damage to homes, roads and infrastructure
Nov 2010 – Jan 2011 (49 days)	Queensland (75% of the state)	Floods	35	200,000 5,900 people evacuated	3,572 commercial properties damages. 3,600 homes damaged.

Natural disasters and extreme weather events Globally July 2010 – April 2011

Date	Location	Event	People killed	People affected	Property impacts
Mar 2011	Japan <i>Most powerful know earthquake to hit Japan. One of the five most powerful earthquakes recorded in the world since 1900.</i>	Earthquake	25,000	200,000 people evacuated, 50,000,000 people affected	To be included
Mar 2011	Burma	Earthquake	74 (not an official figure)	111 injured	To be included
Feb 2011	Christchurch	Earthquake	166	5,907 people injured, 20,000 people affected	3,500 homes destroyed, 1110,000 homes damaged
Dec 2010-Jan 2011	Philippines (19 provinces)	Floods	57	1,230,022 people affected	At least 1300 houses destroyed and 917 damaged
Sept 2010	Canterbury (Darfield, Christchurch)	Earthquake	-	2 people injured	3,500 buildings damaged, 100,000 homes damaged
July 2010	Pakistan	Floods	1,985	18,102,237	Extensive damage to infrastructure and crops