



CULTURAL WORLDVIEWS AND NATURAL HAZARD RISK PERCEPTION: A PILOT STUDY OF AUSTRALIAN ADULTS

Non-peer reviewed research proceedings from the Bushfire and Natural Hazards CRC & AFAC conference
Sydney, 4 – 6 September 2017

Melissa Parsons and Amy Lykins

University of New England
Bushfire and Natural Hazards CRC

Corresponding author: melissa.parsons@une.edu.au





Version	Release history	Date
1.0	Initial release of document	04/09/2017



Australian Government
Department of Industry,
Innovation and Science

Business
Cooperative Research
Centres Programme

All material in this document, except as identified below, is licensed under the Creative Commons Attribution-Non-Commercial 4.0 International Licence.

Material not licensed under the Creative Commons licence:

- Department of Industry, Innovation and Science logo
- Cooperative Research Centres Programme logo
- All graphics and tables.

All content not licenced under the Creative Commons licence is all rights reserved. Permission must be sought from the copyright owner to use this material.



Disclaimer:

University of New England and the Bushfire and Natural Hazards CRC advise that the information contained in this publication comprises general statements based on scientific research. The reader is advised and needs to be aware that such information may be incomplete or unable to be used in any specific situation. No reliance or actions must therefore be made on that information without seeking prior expert professional, scientific and technical advice. To the extent permitted by law, University of New England and the Bushfire and Natural Hazards CRC (including its employees and consultants) exclude all liability to any person for any consequences, including but not limited to all losses, damages, costs, expenses and any other compensation, arising directly or indirectly from using this publication (in part or in whole) and any information or material contained in it.

Publisher:

Bushfire and Natural Hazards CRC

September 2017

Citation: Parsons, M. and Lykins, A. (2017) Cultural worldviews and natural hazard risk perception: a pilot study of Australian adults. In M. Rumsewicz (Ed.), *Research Forum 2017: proceedings from the Research Forum at the Bushfire and Natural Hazards CRC & AFAC Conference*. Melbourne: Bushfire and Natural Hazards CRC.



TABLE OF CONTENTS

Abstract	1
Introduction	2
Background	3
Methods	4
Results	5
Cultural worldviews	5
Relationships between cultural worldviews and natural hazard risk perception	6
Discussion	8
References	9



ABSTRACT

Perception of the risks of natural hazards is considered to be one of the precursors of desirable behaviors of mitigation, preparation, and resilience. However, the processes of risk perception are complex and are likely related to underlying cognitive factors associated with information processing. Cultural worldview theory suggests that people actively choose what to fear (and how much to fear it) in order to support their ways of life (Kahan, 2012). Aspects of these choices may include prioritizing public vs. private interests, choice vs. control, and differing levels of belief and/or adherence to egalitarianism, hierarchy, individualism, and communitarianism. To assess whether and how cultural worldviews relate to perceptions of risk to natural hazards we recruited 503 residents of New South Wales (stratified between urban and regional areas) who completed a cultural worldview questionnaire and a new questionnaire developed by the researchers to assess four aspects of natural hazards: 1) perceptions of the risk of natural hazards; 2) perceptions of control over natural hazards; 3) perceptions of responsibility for natural hazard preparation and outcome; and 4) trust in different sources of information about natural hazards. Results indicated significant but varying relationships among cultural cognition types (i.e., egalitarianism, hierarchy, individualism, communitarianism) and the four aspects of natural hazard risk perception. Some consistency was found regarding how cultural cognition types predicted risk perception across four different types of natural hazards (bushfire, flood, severe thunderstorm, earthquake) but this also varied by geographical location. Understanding the influence of cultural worldviews on attitudes toward natural hazards might lead to community engagement messages orientated to the views of egalitarianism, hierarchy, individualism, and communitarianism.



INTRODUCTION

“Why do people do that?” is a common refrain from agencies involved in assisting communities during natural hazard events. The answers to this question are likely to be complex. However, it is possible that contextual psycho-social factors such as personality, affect (emotion), cognition, and worldviews will strongly influence the actions that people take to prepare for and respond to natural hazard events (Paton and McClure 2013). Sophisticated studies are beginning to unravel the mechanisms behind, for example, bushfire preparation (e.g. McNeill et al. 2016). It is within this setting that we examine the relationships between cultural worldviews of risk and the perceptions that people hold about natural hazards in Australia.



BACKGROUND

Cultural theory proposes that there are two dimensions of sociality – grid and group (Thompson et al. 1990). The grid dimension is the extent of regulation within or without the group, or how one interacts with others (Figure 1). The group dimension is the strength of allegiance to a group, or who one interacts with (Figure 1). These dimensions reflect how people with a common outlook are disposed to impose order on reality in particular ways (Tansey and O'Riordan 1999). The grid-group axes can be labelled as four possible forms of social environment, which inclines people towards four different ways of life (Figure 1). The two dimensions should be seen as polythetic scales – they include a series of aspects but those are not necessarily present in each case observed. (Mamadouh 1999). In terms of risk, cultural theory suggests that people choose what to fear (and how much to fear it) in order to support their way of life (Wildavsky & Dake, 1990). This is known as the cultural theory of risk.

Cultural worldviews are important determinants of environmental risk perceptions (Xue et al. 2014) although studies tend to examine the perceived risks of technological, social and natural hazards together. In this study we focus on different aspects of natural hazards – risk, responsibility, control and trust in information – and examine the associations between these aspects and cultural worldviews.

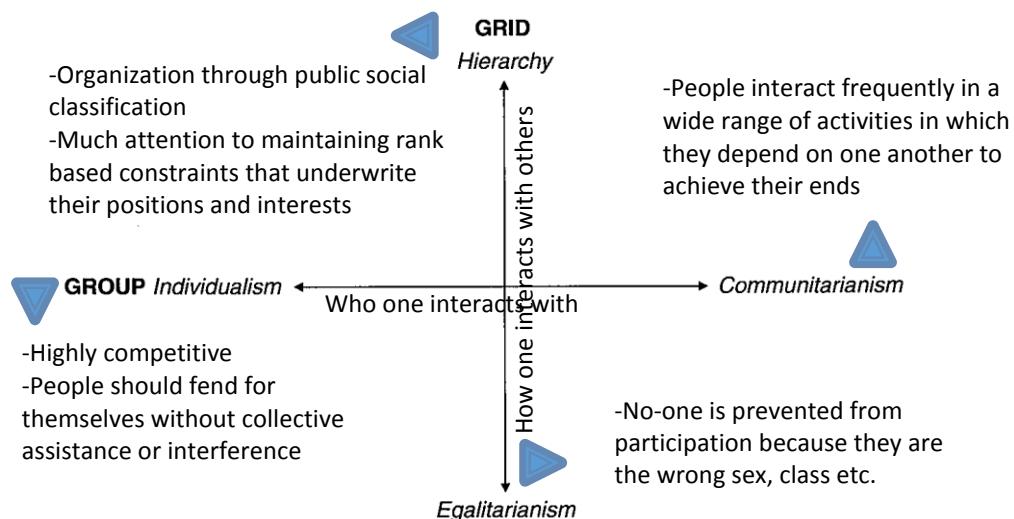


Figure 1. Cultural worldviews or 'ways of life'. Modified from Kahan (2012).



METHODS

To assess whether and how cultural worldviews relate to perceptions of risk to natural hazards we recruited 503 residents of New South Wales (stratified between urban and regional areas) who completed a cultural worldview questionnaire (Kahan 2012) and a new questionnaire developed by the researchers to assess four aspects of natural hazards: 1) perceptions of the risk of natural hazards (Chronbach's Alpha = 0.796); 2) perceptions of responsibility for natural hazard preparation (Chronbach's Alpha = 0.782); 3) perceptions of control over natural hazards (Chronbach's Alpha = 0.670); and 4) trust in different sources of information about natural hazards (Chronbach's Alpha = 0.906). The same questions were repeated for four natural hazards: bushfire, flood, storm and earthquake. Survey participants were recruited using a panel of the Online Research Unit, Sydney. Participants received a reward for completing the survey. The study was conducted under UNE Human Research Ethics Committee approval HE15-332.

Of the 503 survey participants, 60% were female and 40% male. Mirroring the distribution of the NSW population, 64% of participants were from city postcodes and 36% from regional postcodes. Ages of participants varied, with 12% aged 18-30, 59% aged 31-65 and 28% aged 66 or over.



RESULTS

CULTURAL WORLDVIEWS

The survey participants were distributed across the four cultural worldviews (Figure 2). More participants fell into the hierarchical individualism and egalitarian communitarianism worldviews than into the hierarchical communitarianism and egalitarian individualism worldviews (Figure 2). Many of the participants clustered around the midpoints of the axes, indicating that their worldview is not strongly held.

Relatively even numbers of male and female participants fell into the hierarchical individualism ($M = 51\%$, $F = 49\%$) and hierarchical communitarianism ($M = 45\%$, $F = 55\%$) worldviews. However, females dominated the egalitarian individualism ($M = 28\%$, $F = 72\%$) and egalitarian communitarianism ($M = 31\%$, $F = 69\%$) worldviews.

Participants aged 31-65 tended to be distributed relatively evenly across the four worldviews. Participants aged 18-30 were most likely (44%) to fall into the egalitarian communitarianism worldview whereas participants aged 66 and over were most likely (50%) to fall into the hierarchical individualism worldview.

Participants from city and regional areas were distributed relatively evenly across the hierarchical individualism, hierarchical communitarianism and egalitarian individualism worldviews. However, more participants from the city (76%) fell into the egalitarian communitarianism worldview than from regional areas (24%).

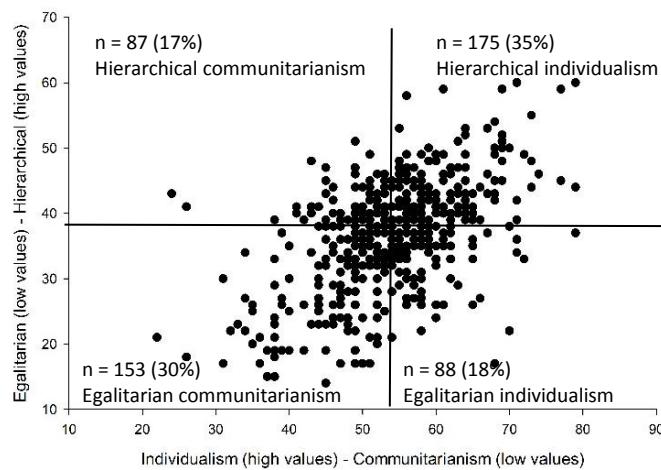


Figure 2. Distribution of participants among cultural worldview dimensions. The boundaries of each cultural worldview are set at the median scores of the egalitarian-hierarchical axis and the individualism-communitarianism axis ($n = 503$).



RELATIONSHIPS BETWEEN CULTURAL WORLDVIEWS AND NATURAL HAZARD RISK PERCEPTION

There was a significant difference in risk perception among people with different cultural worldviews (Table 1). This was consistent for most natural hazards, although there were no differences among people with different cultural worldviews in the perception of risk or the perception of responsibility for bushfire and flood (Table 1).

Table 1. Differences in risk perception among the four cultural worldviews for bushfire, flood, storm and earthquake. The table shows the significance values from a non-parametric Kruskal Wallis test. NS = not significant.

Risk perception item	Natural hazard type			
	Bushfire	Flood	Storm	Earthquake
Perceived risk	NS	NS	0.031	0.009
Perceived responsibility	0.000	0.000	0.000	0.000
Perceived control	0.001	0.020	0.012	0.041
Perceived trust – personal	0.022	0.041	0.044	0.039
Perceived trust – impersonal	0.000	0.000	0.000	0.000

While we only have space to show the results for bushfires here, risk is perceived differently by people with different cultural worldviews (Figure 3). People with the egalitarian individualism worldview perceive higher risks associated with bushfires than those with the other worldviews (Figure 3a). People with the hierarchical individualism or hierarchical communitarianism worldviews perceive greater self-responsibility for bushfires than the other worldviews (Figure 3b). People with the egalitarian communitarianism worldview perceive less control about bushfires than the other worldviews (Figure 3c). People with the egalitarianism individualism or egalitarian communitarianism worldview have greater trust in both personal and impersonal sources of bushfire information (Figure 3d and 3e).

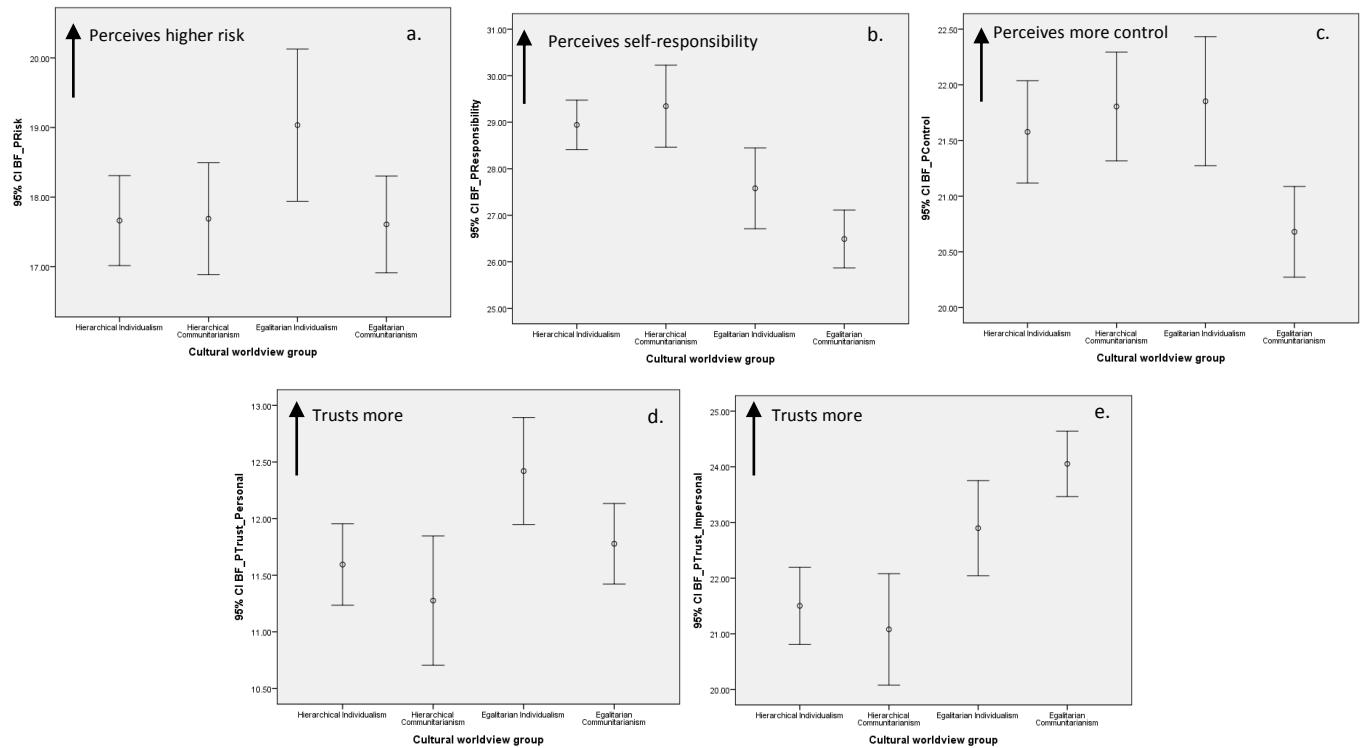


Figure 3. Bushfire risk perception among four cultural worldviews. a) perception of risk, b) perception of responsibility, c) perception of control, d) perception of trust (personal sources) and e) perception of trust (impersonal sources). Arrows on the graphs show the direction of risk perception. In each graph groups from L to R are hierarchical individualism, hierarchical communitarianism, egalitarian individualism and egalitarian communitarianism.



DISCUSSION

The grid-group typology has been used to explain risk perception in different contexts (e.g. Kahan 2012, Xue et al. 2014). The results of this study show that the hypothesis that a person's cultural worldview influences their perception of natural hazards. However, as with other studies (e.g. Brenot et al. 1998, Bouyer et al. 2001) these relationships are variable in strength. Nonetheless, there was a significant difference in the four aspects of risk perception among the cultural worldviews, which was largely consistent for bushfire, flood, storm and earthquake.

People with hierarchical grid orientation may see assertions of danger as implicit indictments of the competence and authority of societal elites (Kahan 2012). In our study we found that people with hierarchical worldviews perceived more self-responsibility for bushfire hazards, and had lower levels of trust in personal and impersonal sources of bushfire information. People with an egalitarian grid orientation may adhere to principles of social justice and cooperation. In our study, we found that people with egalitarian worldviews had more trust in both personal and impersonal sources of information about bushfires, and perceived the responsibility for bushfires to be a collective action. People with the egalitarian communitarianism world view also perceived less control over losses from bushfires.

Future work will analyse the moderating effects of sex, rural or regional location and education on the perception of natural hazard risks.



REFERENCES

1. Bouyer, M., Bagdassarian, S., Chaabanne, S. and Mullet, E. 2001. Personality correlates of risk perception. *Risk Analysis*, 21, 457-465.
2. Brenot, J., Bonnefous, S. and Marris, C. 1998. Testing the cultural theory of risk in France. *Risk Analysis*, 18: 729-739.
3. Kahan, D. 2012. Cultural cognition as a conception of the cultural theory of risk. In: Roeser, S., Hillerbrand, R., Sandin, P. and Peterson, M. (Eds.) *Handbook of Risk Theory*. Springer Science and Business. Pages 726-759.
4. Mamadouh, V. 1999. Grid-group cultural theory: an introduction. *GeoJournal*, 47: 395-409.
5. McNeill, I., Dunlop, P.D., Skinner, T.C. and Morrison, D.L. 2016. Predicting Risk-Mitigating Behaviors From Indecisiveness and Trait Anxiety: Two Cognitive Pathways to Task Avoidance. *Journal of Personality*, 84: 36-45.
6. Paton, D. and McClure, J. 2013. *Preparing for disaster: Building household and community capacity*. Charles C Thomas: Springfield, IL.
7. Tansey, J. and O'Riordan, T. 1999. Cultural theory and risk: a review. *Health, Risk and Society*, 1: 71-90.
8. Thompson, M., Ellis, R. and Wildavsky, A. 1990. *Cultural Theory*. Westview Press.
9. Wildavsky, A. and Dake, K. 1990. Theories of Risk Perception: Who Fears What and Why? *Daedalus*, 119: 41-60.
10. Xue, W., Hine, D.W., Loi, N.M., Thorsteinsson, E.B. and Phillips, W.J. 2014. Cultural worldviews and environmental risk perceptions: A meta-analysis. *Journal of Environmental Psychology*, 40: 249-258.