

# FIRE NOTE

## TOPICS IN THIS EDITION

- COMMUNITY SAFETY
- RISK

ISSUE 134 NOVEMBER 2014

## ANXIETY AND WORRY LINKED WITH LOWER BUSHFIRE PREPAREDNESS: STUDY



◀ The researchers examined the impact of anxiety and stress and negative biases on bushfire preparedness.

### CONTEXT

This research project was designed to enhance understanding of how people behave when under threat. It investigated the impact of the emotional experiences of anxiety and worry on people's intentions and behaviours when confronted with decisions to act on bushfire threat.

The study aimed to identify and investigate the cognitive mechanisms that produce the types of emotional experiences that enhance or impede behaviours that lead to bushfire preparedness.

### BACKGROUND

Health psychology research has shown that affective processes (anxiety and worry) play an important role in how people behave when confronted by information or a situation that requires them to take action to prevent risk.

Recent advances in the field of experimental psychopathology (the scientific study of mental disorders) have identified that anxiety and worry are associated with several biases in the processing of information about threat.

Two types of cognitive biases have commonly been investigated: attentional bias and interpretation bias. Attentional bias refers to the degree to which people automatically attend to negative, threatening information as compared to neutral or positive information. Interpretation bias refers to the degree to which people interpret ambiguous information in a negative rather than benign manner. The aim of the current study was to investigate whether these biased cognitive patterns, specifically for fire-related risk management information, were associated with individual differences in anxiety and worry and how this related to bushfire preparedness.

### SUMMARY

This *Fire Note* outlines research undertaken within the bushfire-prone communities of Roleystone and Kelmscott in the Perth Hills, about 45 minutes east of Perth, Western Australia. The researchers surveyed householders to assess the role of anxiety and worry in relation to how people process bushfire safety and warning information and the impact of these emotions on how they prepare for threat.

The researchers examined two biases in the processing of fire-related information: attentional bias and interpretational bias. Attentional bias is recognised generally as a tendency to focus on the negative, rather than the positive, aspects of information. Interpretation bias is a tendency to interpret ambiguous information as threatening.

The study indicates that actual danger or risk intensifies anxiety and worry in some people who have these biases. Significantly, these people show an increased intention to prepare to mitigate the bushfire risk, but don't necessarily prepare to safeguard their lives and properties.

The findings underline how individuals react differently to risk information, as well as highlight an intentions-behaviour gap in terms of bushfire preparedness. Heightened emotions and cognitive biases may motivate intentions for action, but do not necessarily motivate preparatory action. This has implications for risk behaviour management, especially in the targeting of bushfire education and warning campaigns, as well as the development and delivery of risk management information.

### ABOUT THIS PROJECT

This *Fire Note* reports on the *Managing the threat through the modification of thought* project, conducted under the Bushfire CRC theme *Communicating Risk*.

### AUTHORS

Dr Lies Notebaert (right) and Professor Colin MacLeod, University of Western Australia. Professor David Morrison, Murdoch University. For more information contact [lies.notebaert@uwa.edu.au](mailto:lies.notebaert@uwa.edu.au)





▲ Heightened risk increased the motivation or intention to prepare, but not the action of preparing.

## THE RESEARCH SCHEDULE

Thirty-nine residents of a bushfire-prone area (Roleystone, Kelmescott) that was severely affected by a fire in the previous year participated in the study. Participants were tested in a local community centre using pen and paper questionnaires and computerised tasks. Participants first completed several well validated questionnaires on anxiety and worry. Next, they performed an attentional bias task that involved the presentation of two words of differing classes (e.g. fire-related threat, general threat and neutral/no threat), followed by a target which participants had to identify. An attentional bias towards fire information could be inferred if the time to identify the target was shorter in trials where the target was presented in same location as the fire-related information than on trials where the target was presented at the opposite location.

This attentional task was followed by an interpretational bias task. In this task, participants were asked to listen and rate bushfire risk scenarios which were presented in an audio format via headphones. Participants were asked to imagine themselves in the scenarios described. The scenarios were emotionally ambiguous, in that they could be interpreted either positively or negatively. For example,

in one scenario, participants were told news that “the amount of damage caused by a recent bushfire did not correspond to the intensity of the fire.” Participants were then asked to rate their image of the scenario on valence (whether it was positive or negative). An interpretation bias could be inferred by more negative ratings of the ambiguous scenarios.

Participants were then asked to complete a bushfire preparedness measure. This consisted of a list of activities that could be undertaken to prepare their property for bushfires. For each item, people were asked to indicate how likely it was they would carry out this activity before the start of the fire season. The response scale ranged from *Definitely not* to *Have already done this*. From this, a preparedness intentions measure was calculated (based on the degree to which people intended to carry out the items they had not yet carried out) and an actual preparedness measure (based on the number of items people had already carried out).

## PATTERNS OF THINKING, FEELING AND ACTION

The main aim of the study was to investigate how affective factors and cognitive factors related to bushfire preparedness.

In order to explore the relationship between the emotional variables, the cognitive variables and preparedness, a cluster analysis was performed. Cluster analysis meaningfully identifies groups of people similar to each other, but different from individuals in other groups. Thus, people were clustered into groups according to their patterns of cognitions and emotion. The variables included in the analysis were:

- trait anxiety
- fire-related worry
- fire-unrelated worry
- attentional bias to fire-related threat
- attentional bias to fire-unrelated threat
- interpretation bias for fire-related threat
- interpretation bias for fire-unrelated threat

The data showed two clusters of people. There were significant or marginally significant differences between the two clusters on all variables, except attentional bias for fire-unrelated threat.

People in the first cluster had higher levels of trait anxiety and worry compared to people in the second cluster. These people also showed greater attentional bias to fire-related threat and a more negative interpretation bias for

**END USER STATEMENT**

People react in different ways to information and communication containing calls to action on risk.

This particular health psychology study offers insights on the role and impact of anxiety and worry and negative biases in bushfire risk scenarios. It shows that actual danger or risk intensifies anxiety and worry in some people who have tendencies to focus on the negative or the dangerous aspects of information or situations. As threat levels increase, tendencies to negative biases increase. This can motivate people's intentions to prepare, but does not necessarily result in preparatory action.

The results underline that people are different and have different information needs. Our challenge is to incorporate these insights into ongoing community development and education initiatives in ways that bridge intention-behaviour gaps to mitigate risk within our bushfire-prone communities.

– Damien Killalea  
 Director, Community Fire Safety,  
 Tasmania Fire Service



▲ The research identified an intentions-behaviour gap which has implications for bushfire education and risk information communications.



▲ People can be overwhelmed by information in risk and threatening situations.

both fire-related and fire-unrelated threat compared to people in the second cluster. Interestingly, people in the first cluster were worse prepared, but had higher preparedness intentions than people in the second cluster, both at the start and at the end of the fire season.

The results, which are consistent with previous research, indicate that people exposed to genuine danger, who have tendencies for these negative biases, also have higher levels of anxiety and worry. Moreover, these people also show higher levels of intentions to prepare, but lower levels of

actual bushfire preparedness. This indicates that these heightened emotions and cognitive biases may motivate intentions for action, but not necessarily preparatory action itself.

**APPLYING THE FINDINGS**

The results of the current study are an important first step in understanding how to enhance strategies and tactics for enhancing bushfire preparedness. It provides new insights on the potential for targeting and modifying underlying cognitive processes.

Given that the optimal pattern of attentional and interpretative response to threat can be specified, it would be of significant practical value if techniques could be developed to effectively train these adaptive cognitive styles. The application of such training packages to individuals exposed to bushfire risk could directly enhance their engagement in the constructive planning and behavioural preparation necessary to minimise the prospect of harm.

In recent years, anxiety researchers have sought to modify selective attentional and interpretative response to threat. Specifically, this research was designed to reverse the general attentional vigilance and negative interpretation bias for threat displayed by individuals with dysfunctionally high levels of anxiety, in order to therapeutically alleviate this emotional dysfunction.



▲ As threat levels increase, tendencies to anxiety and negative biases increase and these may result in lower preparedness.

There are two important lessons to be learned from this work. Firstly, it is difficult to alter selective processing styles through direct verbal instruction. There is abundant evidence that verbally instructing participants to attentionally ignore specified categories of information often has the unintended consequence of producing the opposite effect.

This work has also shown that selective attentional and interpretative responses to threat can, however, be reliably modified using a newly developed cognitive technology that bypasses reliance on intention. Such techniques have only just become available in recent years, but this newly developed field of cognitive bias modification (CBM) research has had a profound impact in clinical settings. Typically, CBM approaches build contingencies into computer based tasks, designed to encourage the development of desired styles of cognitive selectivity. Such attentional and interpretative bias manipulation profoundly influences emotional reactions to real-life stressors, and it can have an impact on

emotional functioning for months after interventions. The approach is expected to have general application to the processing of information in non-clinical populations where people are chronically or acutely exposed to an anxiety inducing event such as a bushfire.

### FUTURE DIRECTIONS

Future research should aim to establish the causal relationship between negative cognitive biases, emotion and preparedness. If hypervigilance for threat underlies worse preparedness, reducing this attentional bias to threat could increase preparatory behaviour. Similarly, if a negative interpretation bias underlies worse preparedness, encouraging a more positive interpretation bias could increase engagement in bushfire preparedness.

Second, future research could examine how individual differences in emotional and cognitive processes contribute to taking the step from behavioural intentions to actual behaviour. A lot of literature on this 'intention-behaviour gap' has focused on

### NOW WHAT?

What three things stand out for you about the research covered in this *Fire Note*? What information can you actively use, and how? Tools are available at [www.bushfirecrc.com/firenotes](http://www.bushfirecrc.com/firenotes) to help, along with activities you can run within your team.

## FIRE NOTE

bushfire CRC

### ACTIVITY SHEET 1 ONE KEY ACTION

**PURPOSE**  
This activity sheet is designed for you to lead a discussion with your team to consider the key issues raised by a *Fire Note*, and the impacts these may have on your team.

**OUTCOME**  
Leading this discussion will enable consideration and agreement on:

- 'What' i.e. the key issues raised by the *Fire Note*
- 'So what' i.e. the impacts this might have on the team
- 'Now what' i.e. what could the team do in the future to deal with these impacts?

**SUITABILITY OF ACTIVITY**  
This is a good activity for downtime during a shift or for fire brigade meetings. It has greater value when the theme of the *Fire Note* relates to a topical/current experience for your team.  
It can be conducted in an informal atmosphere, such as around the lunchroom table or sitting around the station.  
The value of the activity is in bringing together views of all members of your team. It overcomes the loudest, most experienced or dominant person trying to hold the floor.

**INSTRUCTIONS**

1. Get each member of the team to read the *Fire Note* that you've selected. Give them 5-10 minutes of quiet time to do this.
2. As people finish reading (some will be faster than others) get them to write down three things that stood out to them from the *Fire Note*.
3. Once they've done this, ask them to discuss these issues in pairs.
4. Then go around each pair and ask them to describe one issue that they identified.
5. Do a round of questions to clarify any points raised.

post-intention processes or intervention characteristics. However, there remains scope for investigating the role of individual difference factors in cognition and emotion, and how the interplay between them can help bridge the gap.

### FURTHER READING

MacLeod C. (2012). Cognitive bias modification procedures in the management of mental disorders. *Current Opinion in Psychiatry*, 25(2), 114-120. doi: 10.1097/YCO.0b013e32834fda4a

Mogg K, & Bradley BP. (1998). A cognitive-motivational analysis of anxiety. *Behaviour Research and Therapy*, 36(9), 809-848.

Notebaert L, Chrystal J, Clarke PJF, Holmes EA, MacLeod C. (2014) When we should worry more: using cognitive bias modification to drive adaptive health behaviour. *PLoS ONE* 9(1): e85092.

Fire Notes were published jointly by the Bushfire Cooperative Research Centre (Bushfire CRC) and the Australasian Fire and Emergency Service Authorities Council (AFAC). This Fire Note was prepared from available research at the time of publication to encourage discussion and debate. The contents of the Fire Note do not necessarily represent the views, policies, practices or positions of any of the individual agencies or organisations who were stakeholders of the Bushfire CRC.

Bushfire Cooperative Research Centre  
Level 5/340 Albert Street  
East Melbourne VIC 3002  
Telephone: 03 9412 9600  
[www.bushfirecrc.com](http://www.bushfirecrc.com)

The Bushfire Cooperative Research Centre was established under the Cooperative Research Centres (CRC) Program. The CRC Program is an Australian Government initiative. The Bushfire CRC is no longer receiving Commonwealth funding and is no longer a part of or associated with the CRC Program.  
Bushfire CRC Limited ABN: 71 103 943 755

Australasian Fire and Emergency Service Authorities Council  
Level 5/340 Albert Street  
East Melbourne VIC 3002  
Telephone: 03 9419 2388  
[www.afac.com.au](http://www.afac.com.au)

AFAC is the peak body for Australasian fire, land management and emergency services, creating synergy across the industry. AFAC was established in 1993.