

Managing stress through the modification of thought.

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Dr. Lies Notebaert

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“The brainwash project.”*

Prof. Colin MacLeod

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*As Lyndsey puts it

Project aims

To improve behavioural threat management through:

- Enhancing understanding of how variation in emotional experience impacts on behavioural preparedness that mitigates threat.
- Establishing the cognitive mechanisms driving the types of emotional experiences that enhance or impede such behavioural preparedness.
- Developing techniques to modify these cognitive mechanisms in ways that foster emotional experiences conducive to effective behavioural preparedness.

Emotion and Preparedness

Emotional
experience

ANXIETY

Affect
Bodily symptoms
Catastrophising

Behavioural
preparedness

Preparedness
Intentions
PREPAREDNESS
Actual
Preparedness

Anxiety



- Anxious apprehension (Barlow, 1988)
 - Acts on a number of physiological and cognitive systems to enhance an individual's ability, and motivation to deal with potential threats.
- Often targeted as an unwanted intrusion to otherwise healthy functioning → Something to be eliminated, reduced
- Anxiety can also be very helpful
 - “Without anxiety little would be accomplished. The performance of athletes, entertainers, executives, artisans and students would suffer; creativity would diminish; crops might not be planted. And we would all achieve that idyllic state long sought after in our fast-paced society of whiling away our lives under a shade tree. This would be as deadly for the species as nuclear war.” (Barlow, 2002)

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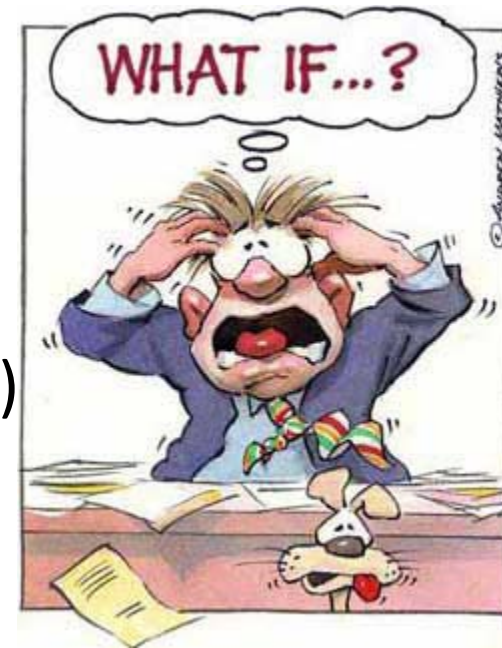
WORRY

Intrusive thoughts
Risk perception
Uncontrollable
thinking

PREPAREDNESS

Worry

- Cognitions which focus on a future negative event
 - ‘Self-talk’ : internal dialogue about a particular concern
- Worry can be influential in determining the adoption of preparedness behaviours.
- Lee & Lemyer, 2009
 - Worry regarding the likelihood of a disaster (terrorist attack) predicts behavioural response to this perceived threat (Avoidance of air travel)



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PREPAREDNESS

Study 1: Questionnaire Assessment

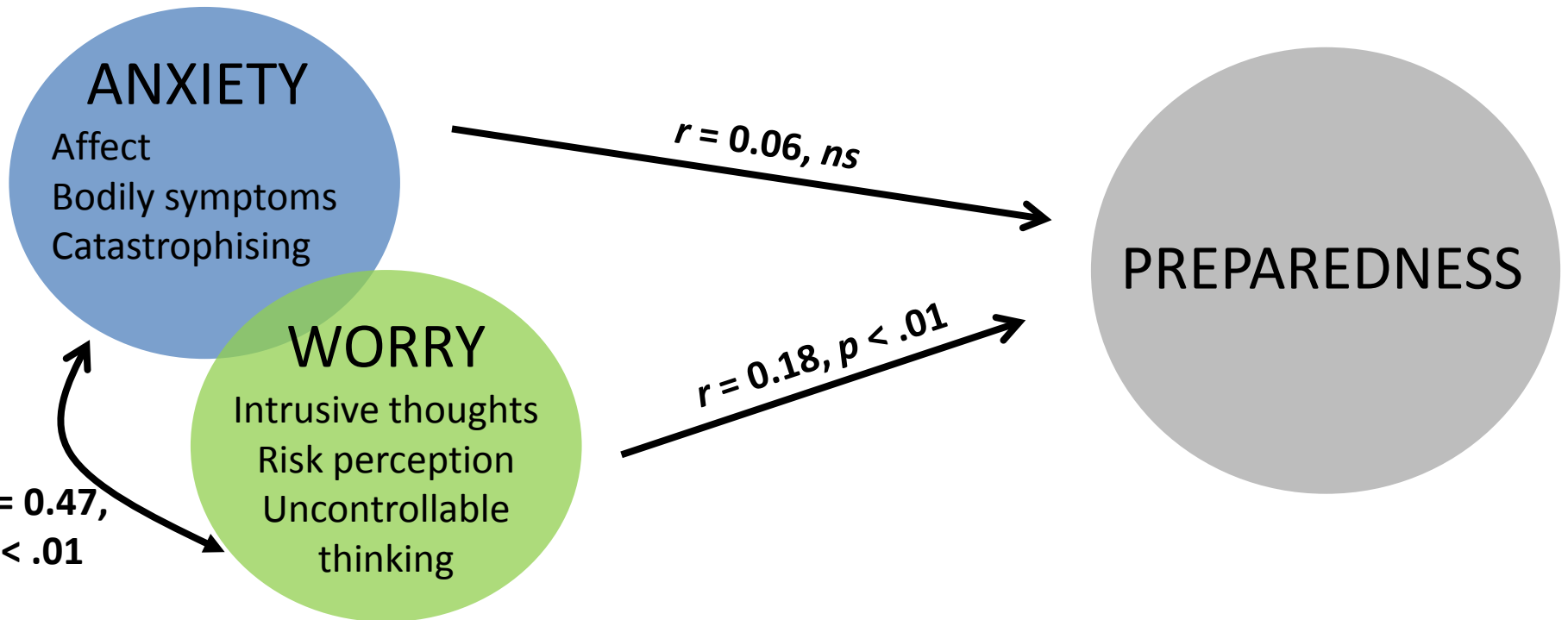
- Kelmscott, Roleystone, Red Hill (WA)
- Feb 5th and 6th fires
- Coordinated interviewing of 400 community members.
- Questions including:
 - Actions on the day
 - Sources monitored for information
 - Preparedness actions prior to the event
- Emotional assessment measures
 - Anxiety (STAI-T)
 - Worry (General and Bushfire)
 - Trauma Symptoms (ASDS)



Study 1: Questionnaire Assessment

Emotional
experience

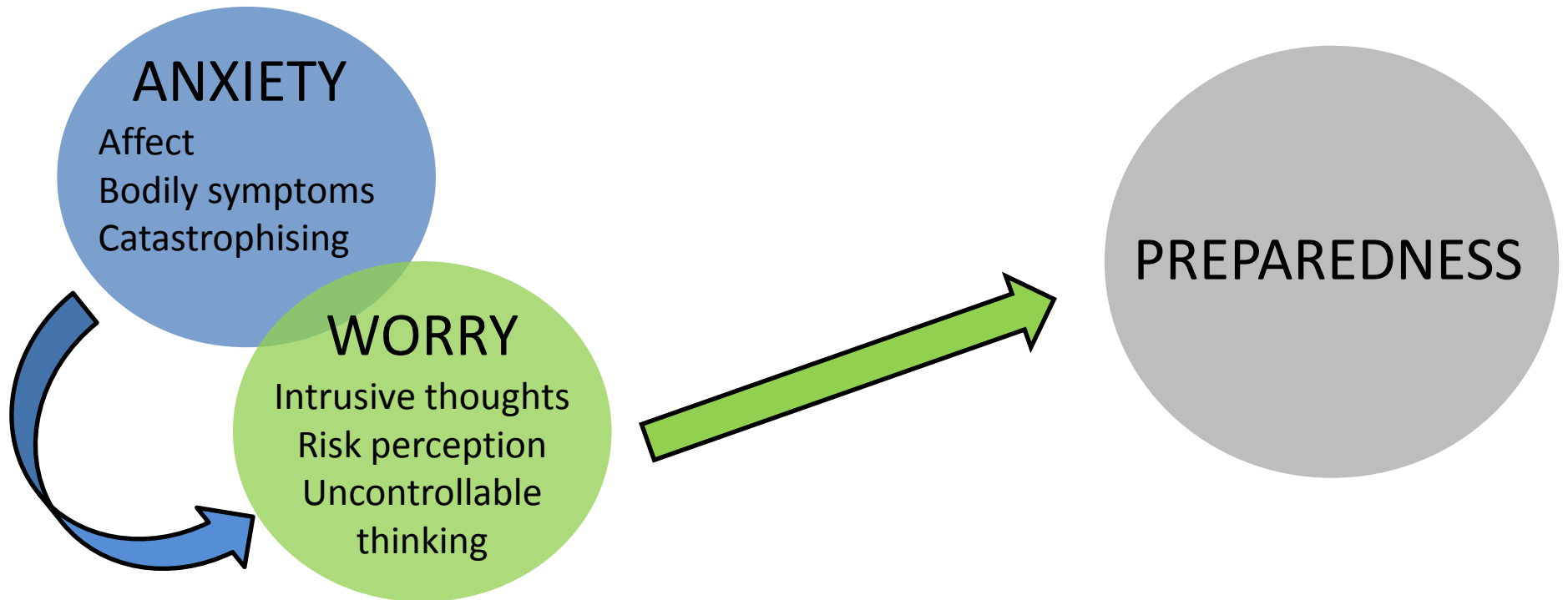
Behavioural
preparedness



Study 1: Questionnaire Assessment

Emotional
experience

Behavioural
preparedness



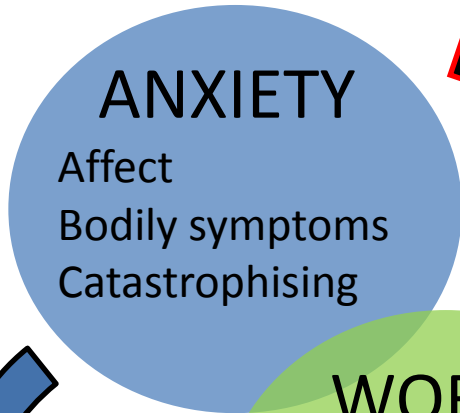
Study 1: Questionnaire Assessment

Cognitive
processing

Emotional
experience

Behavioural
preparedness

Attentional bias
Interpretive bias
Memory bias
Imagery bias



Study 2: Cognitive Bias Assessment

- Participants: 39 Kelmscott/Roleystone residents
- Procedure
 - Questionnaires
 - Anxiety
 - Worry (incl. worry about bushfires)
 - Preparedness questionnaire
 - Cognitive Bias Assessment Tasks
 - Attentional bias assessment
 - Interpretive bias assessment
 - Memory bias assessment
 - Imagery bias assessment
- Total time: 1.5 – 3 hours

Attentional Bias

- Preferential attention to one particular type of information
- Related to anxiety: high anxious people show attentional bias to threat; low anxious do not, and often even show avoidance of threat
- Measured with dot-probe task
(MacLeod, Mathews & Tata, 1986)



+

FIRE

DESK

+

PILLAR

EMBERS

Cognitive process



Anxiety/Worry

Attentional Bias Findings

Heightened attentional bias to fire-related information tended to predict higher levels of anxiety ($p=0.077$)

Interpretation Bias

- The tendency to preferentially resolve ambiguity in one particular way
- Related to anxiety: people with clinical or subclinical levels of anxiety dysfunction show a negative interpretation bias (Mathews, 2011)



Interpretation Bias Assessment

- Present ambiguous scenarios
 - e.g. “You hear that the forecast for the coming fire season leaves the fire fighters very motivated.”
- Measure 1: How (un)pleasant is this situation?
- Measure 2: Ask what people remember:
 - “You hear that the fire fighters are motivated because the forecast for the next fire season predicts few fires.”
 - “You hear that the fire fighters are motivated because the forecast for the next fire season predicts a lot of fires.”

Cognitive process



Anxiety/Worry

Attentional Bias Findings

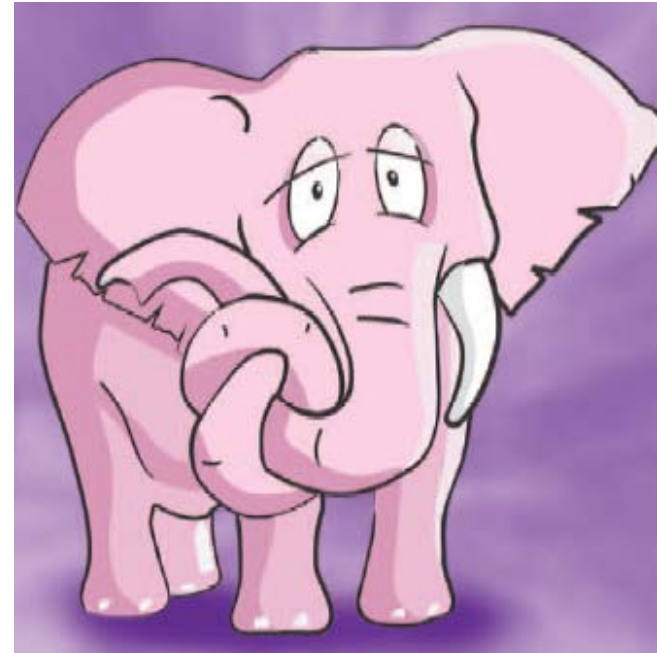
Heightened attentional bias to fire-related information tended to predict higher levels of anxiety ($p=0.077$)

Interpretive Bias Findings

Heightened interpretive bias revealed by ratings of ambiguous fire info predicted higher levels of anxiety and worry ($p<0.05$)

Memory Bias

- Tendency to remember one particular type of events better than others
- Mixed evidence for anxiety linked memory bias favouring negative information
(MacLeod & Mathews, 2004)
- Negative memory bias is a robust characteristic of clinical and subclinical depression



Memory Bias Assessment

- Present unambiguous positive and negative events
 - E.g. i “You are watching a very interesting television documentary on how controlled burning helps to reduce fuel load in the bush.”
 - E.g. ii “You realise that you don’t have a proper bushfire emergency plan, when you watch a television documentary on how a good fire plan can save lives and houses.”
- Afterwards, check memory for the scenarios.

Cognitive process



Anxiety/Worry

Attentional Bias Findings

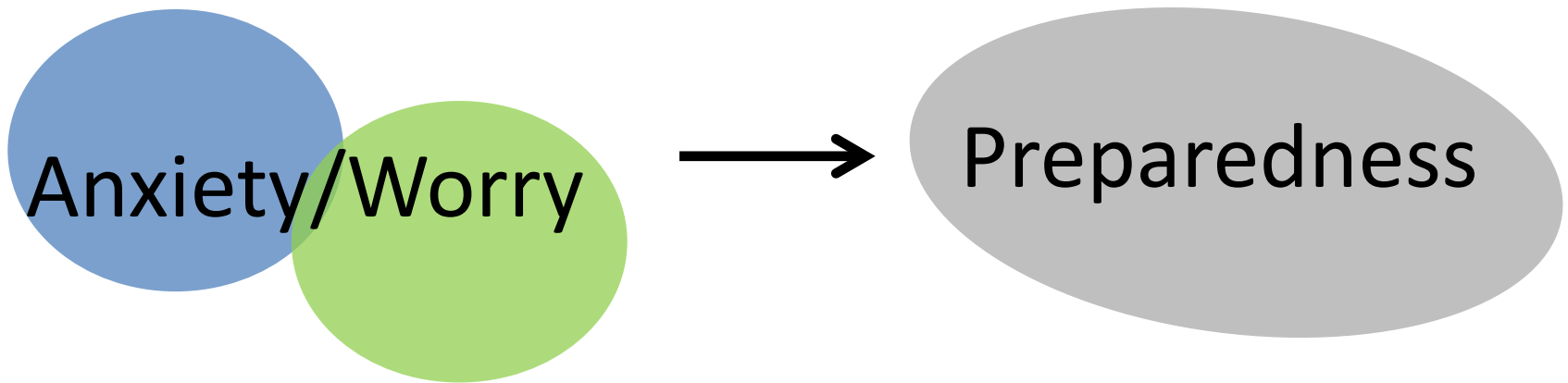
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Memory Bias Findings

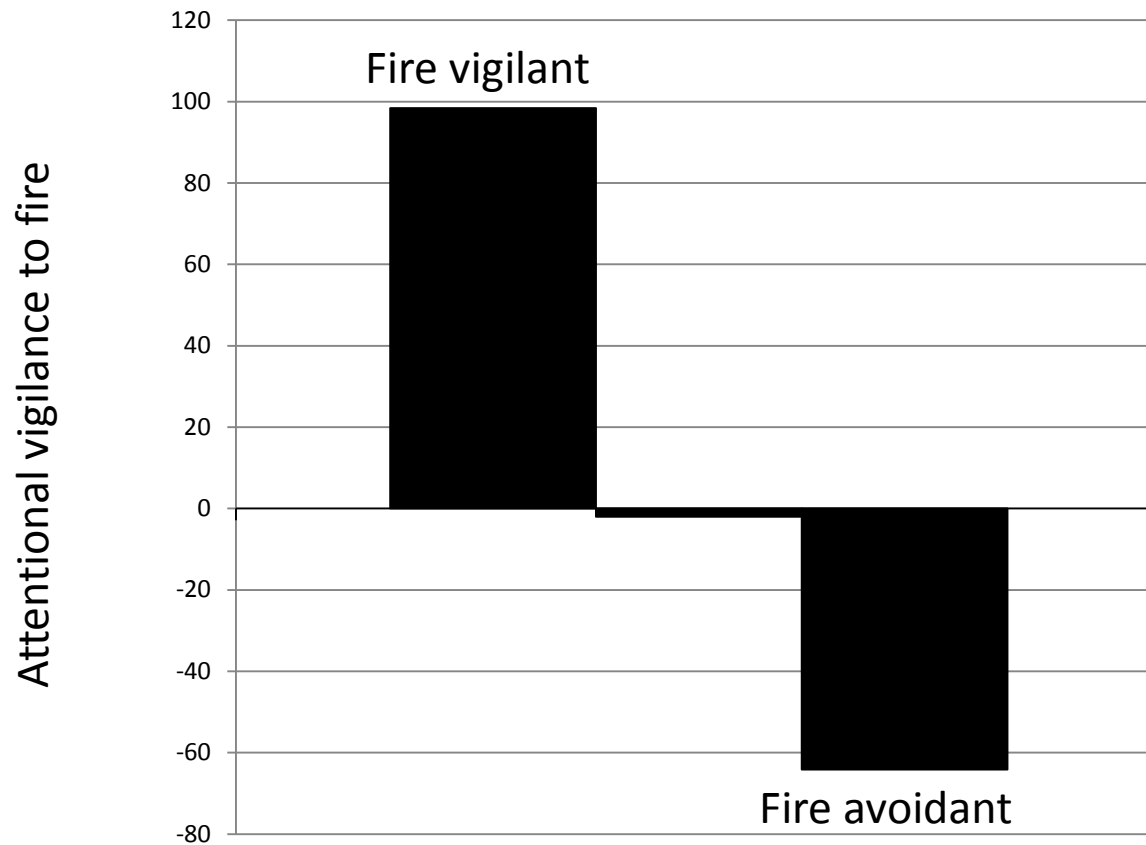
Heightened selective memory for negative fire-related information predicted higher levels of worry ($p<0.05$)



- As in Study 1, worry was again found to be positively correlated with anxiety .
 $r(35) = .73, p < .001$
- Worry found to be positively correlated with preparedness intentions at time of testing, which was before start of fire season.
 $r(32) = 0.45, p < .05$
- Anxiety again found not to be positively correlated with preparedness measures at time of testing, before start of fire season.
 $r(32) = .31, ns$
- Anxiety, did , however, predict preparedness intention in the small subset of participants followed up later in the fire season (when regular exposure to warning messages may have been likely)
 $r(14) = .66, p < .05$

Key clusters of participants

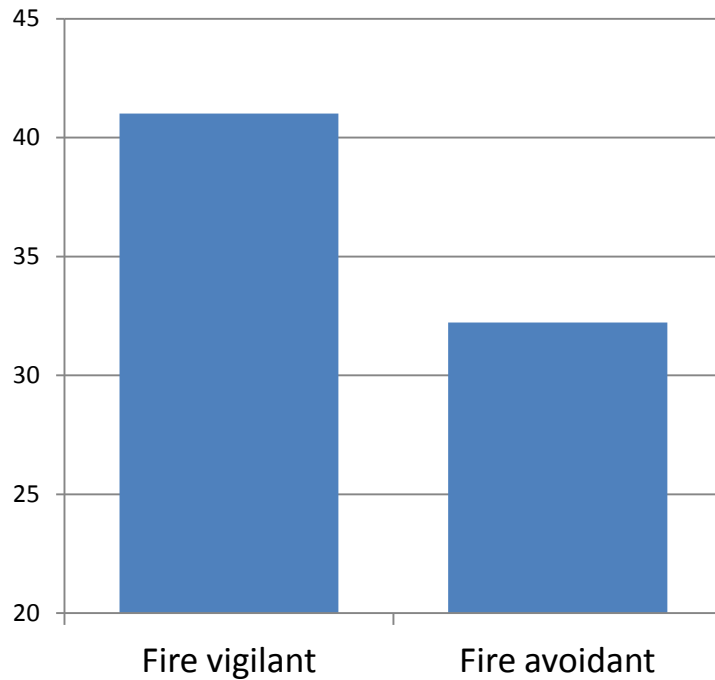
Attentional patterns



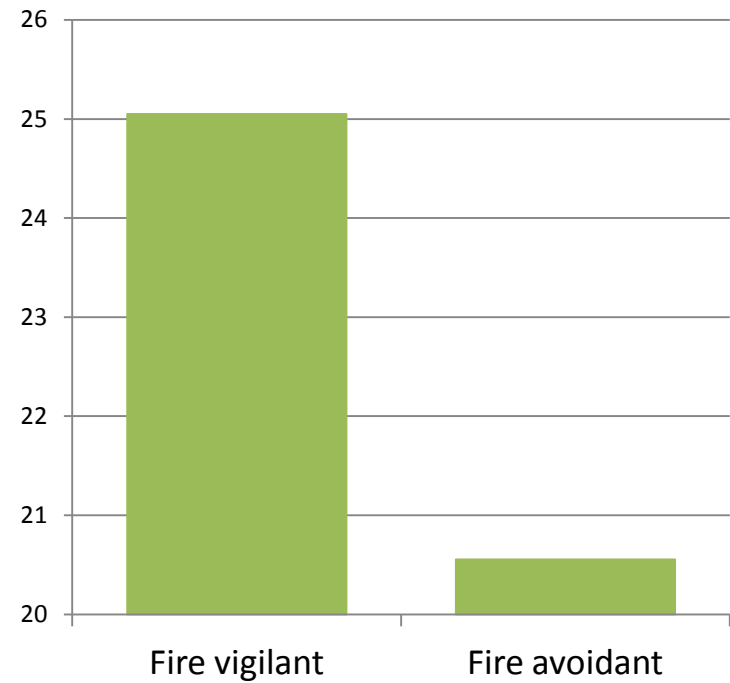
Key clusters of participants

Emotional patterns

Anxiety



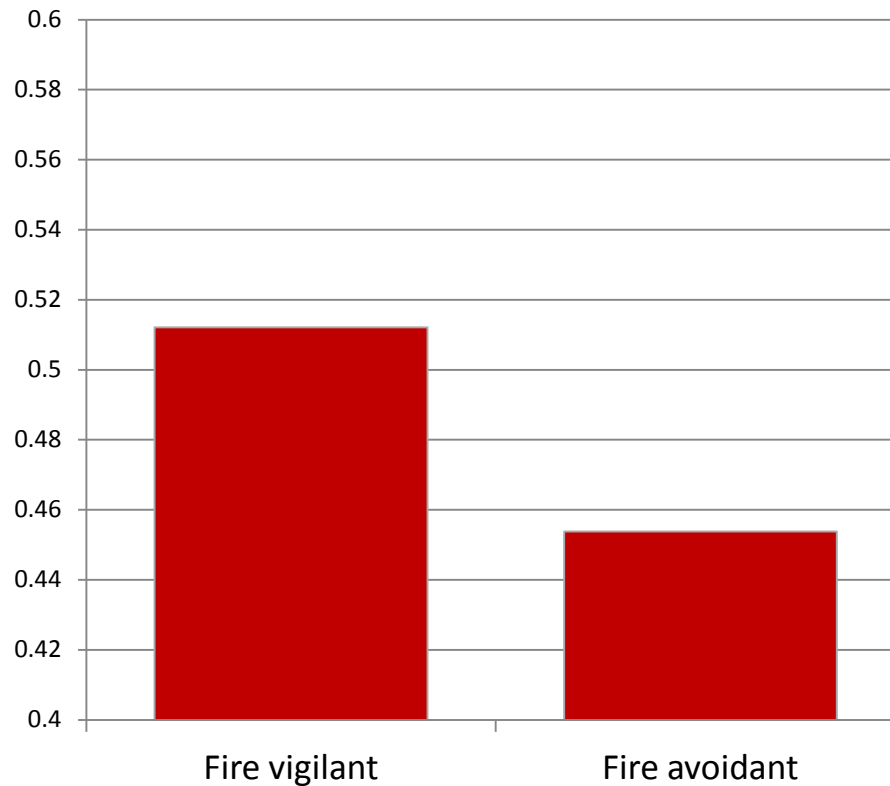
Worry



Key clusters of participants

Preparedness patterns

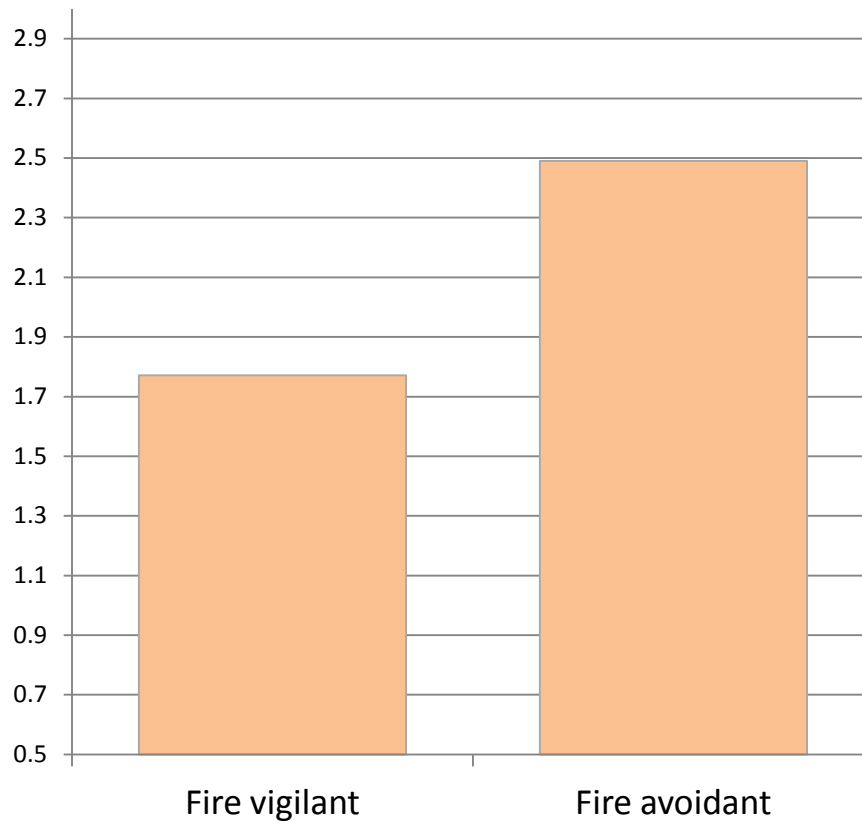
Preparedness



Key clusters of participants

Preparedness patterns

Preparedness intentions

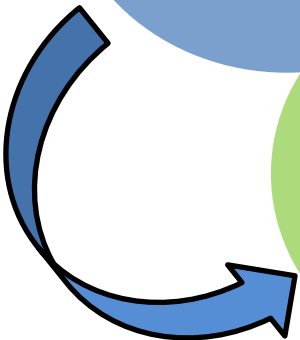
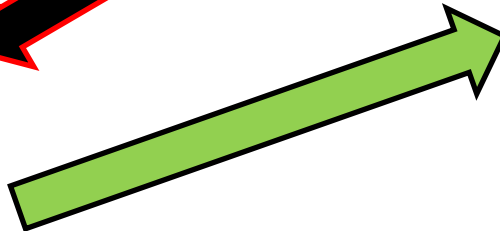
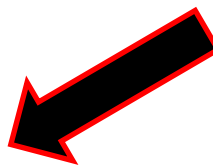
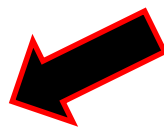
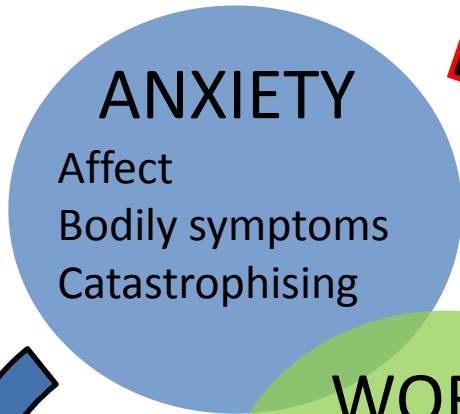


Cognitive
processing

Emotional
experience

Behavioural
preparedness

Selective
Information
Processing



Cognitive processing



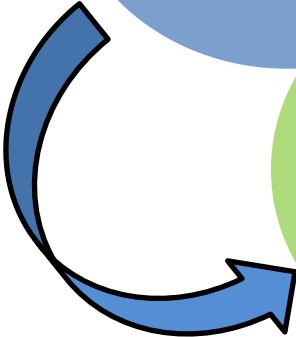
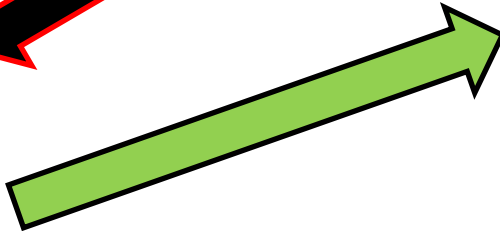
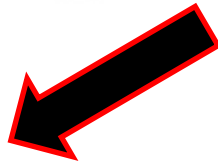
Emotional experience

ANXIETY
Affect
Bodily symptoms
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Behavioural preparedness

PREPAREDNESS



Three Aim of Current Studies

Determine the functional role of cognitive biases

Establish whether attentional bias, interpretive bias, and other forms of cognitive selectivity, causally contribute to emotional experience and to preparedness intention and behaviour, identifying their pathways of influence.

Seek to influence preparedness through CBM

Establish whether the direct modification of attentional bias, interpretive bias, and other forms of cognitive selectivity, through newly developed bias modification techniques, can alter emotional experience and increase preparedness intention and behaviour.

Predict and alter efficacy of media campaign adverts

Establish whether patterns of cognitive selectivity predict impact of emotive adverts on preparedness behaviour, and whether CBM can serve to enhance this impact.



Three Aim of Current Studies

Determine functional role of cognitive biases through CBM

Establish whether attentional bias, interpretive bias, and other forms of cognitive selectivity, causally contribute to emotional experience by directly manipulating such bias and observing impact on emotional experience.

Seek to influence preparedness through CBM

Establish whether the direct modification of attentional bias, interpretive bias, and other forms of cognitive selectivity, through cognitive bias modification techniques, can alter emotional experience and increase preparedness intention and behaviour.

Predict and alter efficacy of media campaign adverts

Establish whether patterns of cognitive selectivity predict impact of emotive adverts on preparedness behaviour, and whether CBM can serve to enhance this impact.



Participant Availability: A Challenge

The Challenge:

Difficult to access sufficient participants for on-site computer testing in bushfire exposed communities (testing facilities, work commitments)

Solution One: Using Analogue Samples:

We complement our bushfire community studies with lab based studies using analogue threat situations that similarly permit risk attenuation through behavioural preparedness; principally the threat of melanoma.

Solution Two: Using On-line Testing:

We now are programming our cognitive assessment tasks and bias modification tasks for on-line and smart phone delivery, to reach greater numbers of participants in bushfire exposed communities



Studies Currently in Progress

General Structure of Current Studies

- CBM phase (Attention or Interpretation)
- Emotional video with preparedness message
- Assess impact of on immediate emotional experience
- Assess impact on preparedness intention
- Ideally, follow-up continuing impact on emotional experience and on subsequent preparedness

Studies Currently in Progress

- Lab analogue studies:
 - CBM-I
 - Cancer council video
 - Assess emotional impact, protection behaviour intention, & behavioural action
- Internet delivered bushfire community studies:
 - CBM-A
 - South Australia bushfire warning video
 - Assess emotional impact, safety behaviour intention, subsequent intrusive worry, & behavioural action

Thank you for your.....

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Implications of Cluster analysis

- Large correlations ($.48 < r < .75$) between worry and preparedness (-), and worry and preparedness intentions (+), in clusters 1 and 2 (who do not show attentional avoidance)
- These correlations are absent ($r < .15$) in Cluster 3 , the group that shows attentional avoidance for fire related information
- → CBM-A towards fire related information?

Support for CBM-A towards threat

- Attentional vigilance to fire (and general threat) is associated with an increase in preparedness intentions over the course of the fire season



Studies Currently in Progress

- Describe as being of two types: Mapping onto the two type distinction in the last slide (which probably will need order reversed for this purpose)
- In each type distinguish CBM-A and CBM-I
- Then go on to general structure applying to all
- Be ready to illustrate the video.
- Summarise that will examine i. capacity of cognitive bias measures to predict variability in, and CBM manipulations to alter, the impact of these confronting warning messages on emotion, preparedness intention, and preparedness behaviour. Mention that seek to examine intrusion prediction and modification of intrusion, with view to identifying the cognitive mode to induce in order to maximise the degree to which these warning messages produce the subsequent cognitive intrusions likely to be necessary to sustain preparedness intention long enough for these intentions to be effectively realized.
- Close with comment of how this is reversal from clinical approach, but draws upon, and contributes to, the same body of knowledge, and hence of likely interest to very wide field of researchers. Hope interest to them too.

Mental Imagery

- The evocation of a perceptual like experience by the processing of information concerning situations not presently being apprehended directly by the senses, such as imagined events, or information retrieved from memory
- Anxiety is related to a heightened engagement in mental imagery when processing information about negative situations

(Hirsch & Holmes, 2007)



Mental Imagery Assessment

- Ask people to imagine themselves in positive and negative fire related scenarios.
 - e.g. i. “You are watching a very interesting television documentary on how controlled burning helps to reduce fuel load in the bush.”
 - e.g. ii. “You realise that you don’t have a proper bushfire emergency plan, when you watch a television documentary on how a good fire plan can save lives and houses.”
- Rate the image of each scenario on how easy it was to form a mental picture, and how subjectively vivid this mental picture is.

Cognitive process



Anxiety/Worry

Attentional Bias Findings

Heightened attentional bias to fire-related information tended to predict higher levels of anxiety ($p=0.077$)

Interpretive Bias Findings

Heightened interpretive bias revealed by ratings of ambiguous fire info predicted higher levels of anxiety and worry ($p<0.05$)

Memory Bias Findings

Heightened selective memory for negative fire-related information predicted higher levels of worry ($p<0.05$)

Imagery Bias Findings

Heightened vividness of fire-related imagery, and impaired for safety related fire info predicted higher levels of worry ($p<0.05$)