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Abstract

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Keywords

well, residents, communication, risk, preparedness, mental, importance, wildfire, defining, prepared

Disciplines

Medicine and Health Sciences | Social and Behavioral Sciences

Publication Details

Eriksen, C. & Prior, T. (2013). Defining the importance of mental preparedness for risk communication and residents well-prepared for wildfire. *International Journal of Disaster Risk Reduction*, 6 87-97.

Defining the Importance of Mental Preparedness for Risk Communication and Residents Well-Prepared for Wildfire

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ABSTRACT

Building on a recognised information-to-action gap in wildfire risk communication, this paper examines what being physically and mentally ‘well prepared’ actually means to wildfire agency staff and volunteers in charge of disseminating risk information. Using the results of an open-ended survey conducted in southeast Australia, we examine how a set of preparedness messages is interpreted. The paper demonstrates that the concept of wildfire preparedness is ambiguous, and that being ‘well prepared’ is a complex mix of practical and mental preparedness measures. Many of the individual interpretations of preparedness messages are found to not align with the official outlined intent. In particular, we argue that the lack of a clear definition and engagement with ‘mental preparedness’ in wildfire risk communication has resulted in an inability to clearly relate to, and articulate what it means to be both physically *and* mentally prepared for wildfire. The survey illustrates how even well-trained wildfire management professionals and volunteers misinterpret relatively uncontested risk messages, and we describe how these misinterpretations might result in dangerous decisions if wildfire threat is realised. The work also reveals three key themes that define different aspects of mental preparedness: emotional control, understanding psychological strain, and the ability to know when and how to implement a wildfire plan. The paper concludes that wildfire risk communication efforts can be improved through heightened attention to the disseminators’ as well as the recipients’ understanding, explanation and adoption of risk information.

KEYWORDS

wildfire, mental and physical preparedness, risk communication, Australia

1. INTRODUCTION

Wildfire management authorities consistently and assiduously direct considerable resources towards communicating the need for landholders to be ‘well prepared’ for wildfire before the statutory wildfire season commences. In Australia agencies advocate the ‘Prepare. Act. Survive.’ policy (a supersession of the pre-2010 ‘Prepare, Stay and Defend or Leave Early’ policy), where preparation is required regardless of planned actions. [1] In comparison, agencies in the United States advocate the need to prepare in order that residents can evacuate in a timely and safe manner. Yet, research and experience shows that many people living in high wildfire risk areas remain underprepared. This information-to-action gap has become a recognised problem in natural hazards research as well as a public policy issue where wildfire poses a threat to society. [2-9]

If being ‘well prepared’ remains the key objective of wildfire risk communication, then this begs the question: what is ‘well prepared’? The term ‘well prepared’ is widely alluded to but the practical and, in particular, the mental aspects of preparedness are often poorly defined (if at all) in most wildfire risk management literature. Risk communication processes conducted over the last ten to fifteen years have nevertheless revolved around this preparation imperative. As outlined below, most risk communication practices rely on passive forms of information such as checklists of practical tasks to complete. However, an explanation of why such tasks need to be completed, or what difference they make in terms of mental preparedness, are rarely provided. At the same time, official wildfire risk information identifies that the ‘well prepared’ property owner provides themselves with the safest possible options for responding to a wildfire event – whether they choose to leave early or actively stay to defend their assets (and lives).

The many recent catastrophic wildfires internationally, and the increasing emphasis on community resilience to wildfire, provide a timely context to examine the ‘user-friendliness’ of wildfire preparedness instructions. The observation that at-risk residents in the United States, frustrated by evacuation orders, are increasingly choosing to actively stay and defend (or passively shelter in place), thus ignoring official advice [10-12] adds another level of urgency to the availability of appropriate and consistent advice and information on how to become adequately prepared [13]. This follows the ideology of Australian wildfire community safety policy, which for

some time has eschewed the ‘fire-fighter to the rescue’ paradigm, recognising the role landholders and communities must play in their own protection. This is particularly the case when dealing with larger wildfires whose intensity, size and duration present a hazard that exceeds the capacity of available agency resources. The position statement of the Australasian Fire and Emergency Services Authorities Council (AFAC) [1, p.5] states that ‘fire fighting resources are likely to be allocated where they will be most effective at protecting lives, not necessarily where property losses are most likely. Fire fighting resources are unlikely to be allocated to property that cannot be defended safely’. This builds on the recognition that household and community wildfire preparedness increases the effectiveness of fire fighting agencies by easing the pressure on agencies’ resources, and assisting them to fulfil their statutory responsibility of managing wildfire in the landscape.

Using southeast Australia as a case study, this paper investigates what being ‘well prepared’ actually means to wildfire agency staff and volunteers. By examining the differences in interpretations of the same set of preparedness messages, we demonstrate that being ‘well prepared’ is a complex mix of both practical and mental preparedness measures. We show that an inability to clearly relate to, and articulate what it means to be both physically *and* mentally prepared for wildfire hampers risk communication efforts and the overall resilience of communities at risk.

2. WHAT DOES ‘WELL PREPARED’ MEAN?

Wildfire risk management agencies in Australasia recognise that being ‘well prepared’ comprises two theoretically explicit aspects: physical preparation (to provide structural protection from a wildfire threat) and mental preparation (that encompasses adequate planning and the development of a psychological capacity to respond). This is evidenced by AFAC’s latest position statement on bushfires and community safety, which argues that ‘defending a well prepared building is a reasonable choice for many physically fit and emotionally prepared people in less than extreme fire conditions’. [1, p.12] This position builds on research conducted in the wake of the 2009 ‘Black Saturday’ wildfires, which found that ‘the extreme nature of the fires appears to have tested the extent of people’s planning and preparedness. An important aspect of this was psychological preparedness, which influenced

peoples' capacity to cope with the fires and their ability to plan and think clearly'. [14, p.13] These authors concluded that effective preparation by householders requires a mix of physical and psychological preparedness, as well as detailed planning. Concordantly, the 2009 Victorian Bushfires Royal Commission [15] concluded that the 'Prepare, Stay and Defend, or Leave Early' policy is sound as long as those who do stay are physically and mentally able. These compelling post-disaster findings emphasise the importance of physical and mental preparedness, and the adjustment of the most recent AFAC position statement suggests that both notions are well understood by agencies despite the lack of detail and emphasis on mental preparedness in their public communications.

2.1 Physical Preparation

Structural or practical preparation for wildfire is a key mechanism that at-risk householders are encouraged by agencies to employ in order to increase their physical resistance and resilience to wildfire. Generally, practical preparations can be grouped into three categories: structural actions, planning actions, and survival actions (Table I). Table I highlights how agencies' recommended actions can be extensive, often time consuming, and sometimes expensive. However, these protective behaviours are encouraged because they yield benefits for the householder, for the community, and for the fire management agencies charged with the protection of lives, property and infrastructure from wildfire.

Table I: Structural, planning and survival preparation actions commonly advocated in wildfire risk communication material in Australia. [16-18]

Structural	Planning	Survival (emergency kit)
Clear dry litter	Know the risk	Torches
Clean gutters	Assess the risk to the house	AM/FM battery-powered radio
Remove trees/shrubs from against the house	Understand how wildfire attacks	Spare batteries
Stack firewood away from house	Make a wildfire action plan	Candles
Have long hoses	Let others know what the plan is	Matches/lighter
Metal buckets	Choose whether to stay and defend or leave early, and who should stay with the house	First aid kit
Ladders	Plan where to meet in a wildfire emergency	Essential medication
Metal rakes/shovels	If you leave, decide when, what to take and by which route	Fire extinguisher
Good access to water supplies	What should be done with pets?	Fire blankets
An alternative water source	How would a power failure affect the wildfire plan	Protective clothing
Keep and maintain a fuel driven water pump	Have adequate insurance	Bottled drinking water
Keep grass mown short	Check your emergency kit	Long-life energy food
Clear undergrowth close to house	Be aware of fire weather, and keep an eye on forecasts	Emergency contact details
Check roof coverings fit well, and maintain roofing	Be aware of fire danger ratings	List and location of valuables
Ensure no structures built of combustible material are attached to the house	Know what to do if fire is approaching	
Screen off under-floor spaces		
Fix metal shutters to windows		

For the most part, official advice on how to prepare for wildfire has been communicated in a passive manner, for example, via websites or by distributing checklists, leaflets or DVDs to landholders known to be at risk of wildfire. [6] The objective of this form of communication (an example of which is provided in Figure 1) is primarily to inform people, increase wildfire salience, and provide information that agencies believe individuals and communities can use to increase their self-sufficiency and resilience to wildfire. This risk communication technique is founded on information dissemination, and relies on the receivers of the information recognising the information is important and meaningful to them, and acting on it in the way the communicating agency deems most appropriate.

Passive communication mechanisms are generally based on an agency assumption that proximity to naturally vegetated areas (for example, the wildland-urban interface (WUI)), and objective wildfire risk perception are the main determinants of landholders' protective action. [19, 20] However, recent research examining the socio-cognitive determinants of wildfire preparation shows that perception of risk can play a relatively minor role in landholder preparation decisions in the context of competing everyday priorities, environmental values or financial constraints. [5, 21-24] Instead other factors like outcome expectancy, native vegetation management, or sense of community can provide stronger incentives. Research suggests that passive methods of communicating about practical preparedness measures may even serve to confound the act of being 'well prepared'. This is particularly evident in the unrealistic optimism of some at-risk householders using preparation checklists. For example, Paton et al. [25] and Prior [16] found at-risk householders' ability to 'check off' a large proportion of preparation actions listed on agency-supplied wildfire preparation checklists contributed to unrealistic optimism about how 'well prepared' they were. [see also, 26, 27] While a checklist certainly provides an extensive list of actions that are likely to reduce landholder vulnerability to wildfire, the relative preparatory importance of each item (and particularly those most commonly undertaken, like mowing the lawn, clearing gutters or trimming vegetation close to the house) for the landholder's overall wildfire preparedness may vary considerably. A large proportion of WUI inhabitants surveyed by Prior [16] indicated they had undertaken many of the less consequential actions simply because they were included on the checklist and not because the respondents had any special awareness of wildfire risk, or knowledge of the reasons why these preparations were advocated.

2.2 Mental Preparation

Mental (or psychological) preparation for wildfire is both intangible and individual. It complements physical preparation with the psychological and emotional capacity to actually undertake physical preparations, and to actively cope with the threat and consequences of wildfire. Mental preparedness for wildfire requires the householder to not only be cognisant of the risk it poses, but also to consider the ability to cope with the sensory strains of a raging wildfire. Recent research suggests that most people at-risk do not systematically prepare mentally for wildfire, even though socio-

cognitive factors play key roles in determining individuals' wildfire resilience levels. [5, 14, 19, 28, 29] The reviewed literature demonstrates that people decide to prepare based on socio-cognitive processing of a wide range of factors, mental and material, and do not solely rely on information or the perception of risk to direct their protective behaviours. That mental processes played out in arriving at a course of action are important is unquestioned, but much of the research exploring the outcome of these socio-cognitive processes illustrates that these primarily result in decisions relating to the physical practicalities of responding to wildfire threat – at the most basic, “should I stay and defend my property, or should I leave?” It is likely that different socio-cognitive factors play a role in the decision to be mentally prepared, but because people are generally not mentally prepared, it is much more difficult to explore what these factors might be.

Mental preparedness has to date not been systematically described or communicated in Australasian or North American wildfire risk mitigation literature or processes, despite being consistently referred to as a fundamental characteristic of being ‘well prepared’ in community safety literature and findings from inquiries into past wildfire incidents. [12, 15, 30, 31] However, the New South Wales (NSW) Rural Fire Service (RFS) and Fire and Rescue NSW made a genuine combined attempt at clarifying the particulars of preparedness in the guide ‘Bush Fire Survival Plan’ [17], which was revised after due consideration was given to the recommendations handed down by the 2009 Victorian Royal Bushfire Commission. [15] On page six, the guide states:

‘Preparation is not just about cleaning up around the house and having a plan. It is also about making sure you consider your physical, mental and emotional preparedness. A bush fire can be a terrifying situation. Strong gusty winds, intense heat and flames will make you tired quickly. Thick, heavy smoke will sting your eyes and choke your lungs. It will be difficult to see and breathe. The roaring sound of the fire approaching will deafen you. Embers will rain down, causing spot fires all around you. Power and water may be cut off. You may be isolated. It will be dark, noisy and extremely physically and mentally demanding. If you have any doubts about your ability to cope you should plan to Leave Early.’

This description of ‘what to expect’ is unusually detailed. The guide furthermore provides refreshingly detailed factsheets on how to physically prepare an at-risk

property for both ‘stay and defend’ and ‘leave early’ scenarios. However, no further detail is provided to assist the householder on how to become more mentally and emotionally prepared, or what these qualities actually mean in practice for psychological resilience. Furthermore, little dedicated research has explored such issues of practical psychological preparation, and none in a wildfire preparation context.

2.2.1 Conceptual modelling of protective action

From a theoretical perspective, a significant amount of risk communication and protective action literature has been informed by a range of conceptual frameworks. These include models like the ‘Theory of Reasoned Action’ [32], the ‘Theory of Planned Behaviour’ [33], and ‘the ‘Person Relative to Event Model’ [34]. These models have been developed to generically depict the way people might make decisions about taking protective action, and consequently draw on elements that relate to mental preparedness. While these models have broadened research and official thinking about what factors play a role in protective action decisions [35], they have typically been explored in ways that are too generic for application in a practical context. In a practical sense, the theory is also too complex to engender changes in individuals’ protective behaviour. Ultimately the development of such individual feelings and perceptions, and therefore preparedness, are influenced by finer individual (cognitive), cultural, societal, contextual, and threat specific factors (see for example [36]).

In this paper we focus on the practices of encouraging preparation, and on what ‘being prepared’ means to individuals. With this work we aim not to deepen the underlying conceptual discussion about what might or might not influence protective or preparedness decisions, but to better understand how individuals’ interpretations of risk messages might inform better risk communication. Dedicating attention to better understanding both the causal (or conceptual) influences on preparedness and the interpretational variability among people receiving (and creating) risk messages are complementary activities in the development of more effective risk communication and engagement practices.

2.2.2 Mental preparedness in practice

Little applied research has to date been published on how to foster mental and psychological preparedness among the public. One study [37] identified the key outcomes of psychological preparedness as reduced anxiety, less uncertainty, and increased coping ability, all of which apply to mental preparedness for wildfire and other natural disasters. [38-41] Indeed, Prior [16] found that peoples' self-efficacy for wildfire preparedness was affected detrimentally by fear and anxiety. Interviews with householders demonstrated for the most part that both fear and anxiety could be reduced if householders actively contemplated the risk wildfire posed to their lives and lifestyles. Importantly, this act of mental processing allowed the householders to contextualise the risk wildfire posed, and to recognise the need to take early and decisive action to prepare, stay and defend, or to leave early. However, given the individualistic nature of psychological processes, it is likely that the adoption and subsequent effects of psychological preparedness will vary according to the circumstance and the individual personalities of the people experiencing a threat. This individualism is also likely to confound efforts to conceptually describe generic processes that underpin decisions to undertake protective behaviours like those discussed in Section 2.2.1.

Perry and Lindell [42] suggest that psychological preparedness is linked to 'disaster subcultures' in communities, which are: a) organised groups of people who have previously or routinely experienced a disaster, and b) have developed a certain familiarity with the hazard and how they should respond before, during and after the event. As wildfire is a community threat (i.e. not just a threat to individual households) the influence of other community members can play a formative role in the development of mental preparedness for wildfire. Communities that possess an awareness of wildfire, a collective knowledge about how to address wildfire threat, and an interest in sharing the burden of preparing their communities, exhibit a higher level of community resilience. Such communities are therefore more likely to have members whose level of mental preparation exceeds the norm. [22, 42, 43] The community's interactions concerning wildfire preparedness also increase their capacity to understand and address the uncertainty and challenging nature of events like wildfire. [44-46]

While adequate forewarning permits a degree of psychological preparedness, as highlighted by Fritz and Marks, [47] more recent research demonstrates that many at-risk landholders are unlikely to complete physical preparations even after receiving wildfire risk information or warnings. [5, 21, 48-55] If psychological preparedness developed as a result of forewarning, then the number of householders leaving a wildfire-threatened house at the last minute, as was the case in the 'Black Saturday' wildfires, [14, 56, 57] would likely be considerably lower.

Being 'well prepared' is consequently as dependent on a mindset influenced by personal attitudes, emotions, experiences, everyday life and by the people with whom associations are formed, as it is on water, hoses, buckets and ladders (*et cetera*), which can be used to douse embers and check the roof. Whilst the theoretical importance of a mix of practical and psychological preparation is clearly recognised in the literature and risk communication discussed above, little effort has been directed toward stimulating *both* elements of preparation in practice. Nor have theoretical models been widely successful in a practical sense in informing risk communication practices that stimulate psychological preparedness. Instead, wildfire risk communication tends to concentrate on the tangible practical aspects of preparedness that are considerably easier to communicate and demonstrate. [58-60] Communicating the need to be psychologically prepared is greatly challenged by the individualistic nature of, and context-specific influences over, psychological processes. Such processes cannot be addressed using traditional mass-communicated risk information but rather require a concerted, creative, and much more interactive approach to wildfire risk communication than has been utilised to date. [6]

In this paper, we explore the consequences of the lack of a clear definition and engagement with mental preparedness in wildfire risk communication. We focus on how this ambiguity affects people who live and work with wildfire in southeast Australia. After describing our research methodology and case study, we examine what being physically and mentally 'well prepared' actually means to wildfire agency staff and volunteers in charge of disseminating wildfire risk communication by examining how they interpret a set of preparedness messages.

3. METHODOLOGY

A ten-question survey was conducted in order to explore what being ‘well prepared’ means to, and how key preparedness messages are interpreted by, different disseminators and recipients of wildfire risk information. Nine questions (all open-ended responses) corresponded to official preparedness messages drawn directly from the instructions provided in the *Prepare. Act. Survive.* brochure (Figure 1) disseminated by the NSW Rural Fire Service and Fire and Rescue NSW, Australia. The survey asked: ‘Why should you act on the following instructions?’ and focused on the nine instructions on Figure 1 that do not provide contextual explanations (such as the purpose of facing the pressure relief valve outwards) or guiding words (such as ‘flammable’ or ‘non-combustible’). An example was provided: ‘Make sure the pressure relief valves on LPG cylinders face outwards. *So flame is not directed toward the house*’. To specifically explore respondents’ understanding of mental preparedness, the survey lastly asked: “You need to be both mentally and physically prepared to carry out your Bush Fire Survival Plan” – what does ‘mentally prepared’ mean?

Figure 1: Wildfire preparedness instructions provided in the *Prepare. Act. Survive.* brochure. [60]

The survey was conducted at the Australasian Community Engagement and Fire Awareness Conference hosted by the NSW RFS in Newcastle in May 2010. Conference participants included community engagement volunteers, volunteer fire fighters, and head office staff of the NSW RFS. The participants represented a subset of society who actively engage with wildfire professionally (particularly with practical aspects of wildfire risk communication) and as homeowners living in wildfire-prone areas. How this subset of the 'wildfire community' interprets and view risk messages is therefore important in the context of enhancing risk communication strategies.

The survey was included in the conference pack of all delegates and 67 completed surveys were returned (a response rate of 27% based on the estimated number of 250 conference attendees). The survey was anonymous but did gather demographic details on gender and age to enable differences in responses to be tested against these variables. An open-ended response survey was used in this research to ensure responses were obtained from as many conference attendees as possible. Alternative qualitative methods, such as semi-structured interviews or focus groups would have reduced the response rate considerably due to the time constraints and competition of other conference sessions.

The data from the 67 survey responses was analysed using the Computer Assisted Qualitative Data Analysis Software program NVivo v.9. [61] The main themes on mental preparedness were identified via thematic coding. These main themes were then compared against the results of word frequency and text queries, while matrix queries were used to test for differences in responses by gender and age. The aim of this analysis was to identify patterns in the ways different recipients interpreted and understood practical and mental wildfire preparedness information. The analysis created a baseline of insights that hitherto have not been reported in wildfire preparedness literature, and can be used in future studies with a larger sample size to further explore the preliminary patterns described.

4. THE REALITY OF BEING 'WELL PREPARED': EXAMPLES FROM SOUTHEAST AUSTRALIA

The tendency to focus on the dissemination of fixed ideas in wildfire education (such

as, ‘keep gutters clear of leaves’), rather than the actual process of understanding the implications of these ideas (i.e. the purpose, ‘to lessen the chance of ember ignition’) is inherently problematic in the context of the diversity of people living and working in wildfire-prone areas. [6] The following sections focus on three examples commonly encountered in the survey data, which illustrate how the ambiguity of communication about wildfire risk can influence both perceptions of preparedness and actual preparedness behaviour. Firstly, we explore how survey respondents interpret the ‘Prepare, Stay and Defend or Leave Early’ concept inherent to the ‘Prepare. Act. Survive.’ policy, and show that the dichotomous nature of the concept often results in a distinction between preparing or not preparing depending on whether the intended plan of action is to stay and defend or to leave early. This contradicts official messages that clearly point out people should prepare regardless of their plan of action. Secondly, we explore how different individual circumstances (values, beliefs, experiences or attitudes) can lead to different interpretations of the same message. Lastly, we examine what it means to be mentally prepared based on the survey respondents’ perceptions, and point out the inherent difficulty of engaging and communicating unambiguously about mental preparedness without a coherent meaning of the concept.

4.1 Example 1: “Why prepare? We’re leaving”

The ‘Prepare. Act. Survive.’ policy adopted and advocated by Australian fire management agencies makes the importance of a wildfire action plan and the need to choose between staying to defend and leaving early quite clear. However, these agencies also point out that *all* householders should prepare *regardless* of their plan to stay and defend or leave early. Importantly, our research found that many people misinterpret the preparedness imperative of this message. There is a problematic tendency throughout the survey responses to distinguish between actions needed for staying and defending compared with actions required if leaving early. In this way the two options within the single policy (stay and defend or leave early) represent dichotomous preparation choices: staying is associated with preparing, and leaving is associated with not preparing. Mental preparedness in particular seems only to be considered necessary if the plan is to stay and defend. For example, a survey respondent stated that to be “Able to implement [a] plan effectively and without panic

is especially important if defending.” Another respondent highlighted the need to “Be confident that you can cope with the wind, noise, and heat. You must be committed to staying and actively defending your property”. While these points are true, they fail to highlight that the ability to deal with panic and coping with wind, noise and heat might be equally necessary if evacuating, because roads and other evacuation routes are likely to be treacherous due to these very conditions. This is particularly important given the ‘wait and see’ trend detected in this study as well as other studies in Australia [5, 57, 62, 63], which highlights that many residents ultimately leave the decision to stay and defend or leave early to the very last minute. The wildfire fatalities trends presented in the work of Haynes et al. [64] and Handmer et al. [56] on activities at time of death demonstrate the potentially dire consequences of such indecisiveness. Without explanatory context many at-risk people are incapable of interpreting risk messages within the constraints of their own context – namely that being ‘well prepared’ is necessary regardless of plans to evacuate or staying to defend, as the wildfire’s behaviour may determine the actual course of action. Staying to defend, or even sheltering in place, may become a reality even for residents who originally plan to evacuate.

4.2 Example 2: Same information, different ears

That people apply individualised interpretive frameworks when reading wildfire risk information was clear from the open-ended survey responses. Inconsistencies were found in participants’ descriptive interpretations of the purpose of the risk information contained in Figure 1. Textbox 1, for example, show the variety in responses with regards to the reasons to act on the following statement: ‘Check the conditions of your roof: replace any damaged tiles, external walls or cladding, seal any gaps’.

Textbox 1

Why should you act on the following statement: ‘Check the conditions of your roof: replace any damaged tiles, external walls or cladding, seal any gaps’?

“To ensure it does not leak or cause flooding.”

“This is to prevent ember entry into the house cavities (reduce the opportunity for fire to get into the house.”

“Prevent any fires.”

“Safety – prevents damage and inconvenience of time waiting for insurance inspectors and for damage to be rectified.”

“This is general maintenance.”

“Stop embers being blown into roof space.”

These quotes demonstrate that individual interpretive differences exist between all people receiving or disseminating wildfire risk information: both in terms of meaning and how details are understood. The communication of this information is arguably corrupted by the individual interpretations the above quotes allude to. Wildfire management agencies perceive the information and advice they provide to the public to be objective, rational and warrant rational action as it is derived from the substantial knowledge gained through the experience of the organisations. It is elucidated by the risk communicators’ collective social and experiential construction of wildfire risk, and therefore considered to be objectively rational. It is meaningless to any given individual, however, if that person lacks the context and rationale behind the message or distrusts the validity of the stipulated action. People attach meaning to, and interpret wildfire risk communication information with respect to socio-psychological cues and their individual experiential constructions of wildfire risk, meaning these interpretations even vary among personnel within a single agency.

4.3 Example 3: What exactly does it mean to be mentally prepared?

As in the case of physical preparations, survey participants were also asked to describe ‘mental preparedness’. Recent wildfire preparation checklists issued by the NSW RFS state that: “You need to be both mentally and physically prepared to carry out your Bushfire Survival Plan”. [60] Survey participants were asked to describe what was meant by ‘mentally prepared’. Examples of the answers are provided in Textbox 2. Although mental preparedness is referred to in risk communication material, variability in interpretations of the meaning of ‘mental preparation’ was expected due to the lack of tangible advice on how to develop such psychological capacities. As the second key component of wildfire preparedness highlighted by AFAC, the official Australasian fire authority, [1] any such variability in interpretations of mental preparedness is consequential from a wildfire resilience perspective.

Textbox 2

“You need to be both mentally and physically prepared to carry out your Bushfire Survival Plan”. What does ‘mentally prepared’ mean?

“To be able to handle an extremely scary situation. To be able to cope with the sky going black, having a short distance of visibility. To experience difficulty breathing because of smoke, and to be able to cope with the ‘roar’ of the fire – like a plane taking off – and be able to function capably.”

“An awareness of what you might expect and how stressful it might be once a fire approaches.”

“Mentally means that conditions can quickly become extremely adverse, probably life-threatening if you stay. If the plan is based on leaving early, must be mentally prepared to accept the home may get burnt to the ground.”

“Because fires can cause mental anguish, you need to be mentally prepared. Fear can override your normal practical decisions.”

“Able to implement plan effectively and without panic. Especially important if defending.”

Again, the variety of responses outlined in Textbox 2 reflects individual and heterogeneous conceptions of a single message. Lacking, however, is a clear, consistent answer in the survey responses that would reflect either a good understanding of the psychological and emotional capacities required to cope with wildfire, or an effective official description of a complex concept. Whilst reference was made in various ways to the importance of being calm, decisive, resilient, knowledgeable of conditions, and able to act under extreme pressure, few responses truly got to the core of what ‘mental preparedness’ means. One respondent did, however, provide a clear conception of mental preparedness by describing how mental preparedness enables a person at-risk to override debilitating fear when it override one’s normal decision making processes:

“Because fires can cause mental anguish, you need to be mentally prepared. Fear can override your normal practical decisions.”

Qualitative analysis of the open-ended survey responses revealed three key thematic aspects of mental preparedness: 1) maintaining emotional control, 2) understanding the psychological strain of wildfire, and 3) implementing an organised, practiced plan (see column 1 of Table II). The first two themes clearly relate to questions of mental preparedness, while the third theme is important because psychological processes

mediate the acquisition of information and consequent actions (i.e. making, communicating and practicing plans aids mental preparedness to natural hazards). [65-67] However, it should be noted that most answers emphasising the need for an organised plan did not specify what type of plan (e.g. written, mental, verbal) or how it could be implemented (e.g. identified roles for household members). Rather, the answers tended to focus on practical aspects of wildfire preparedness planning and actions.

Table II: Main identified mental preparedness themes in survey responses.

Main identified mental preparedness themes	Sub-themes and words included in text and frequency queries
(1) Emotional control: staying calm, not panicking, maintaining control (being able to think logically)	(1a) Ability to maintain emotional control: able, ability, abilities, capabilities, capability, capable, capably, cope, coping, panic, panics, panicky, panicking, panicked, stress, stressed, stressful, stressing, calm, calmly, fear, fearful, fears, control, controls, controlling, controlled, decision, decisions, decisive, decisiveness
(2) Understanding psychological strain: understanding the realities of fire (psychological stress of noise, smoke, heat, etc.)	(2a) Understanding of conditions that lead to psychological strain: heat, noise, smoke, smoky, situation, situations, condition, conditions
	(2b) Knowledge that psychological strain may be encountered: know, knowing, knows, knowledge, knowledges, experience, experienced, experiences, expert, expertise, understand, understands, understanding, understood, aware, awareness
(3) Being prepared (to implement organised, practiced plan)	(3a) Ability to implement a prepared and practiced plan: practiced, practical, practice, practicing, training, expect, planning, plan, planned, plans, preparation, prepare, prepared
	(3b) Knowledge of when to implement a plan: leave, leaving, stay, staying, fight, fighting, when, ready, readiness, time, times, timing

Table II outlines the words included in each of the three main themes derived from the responses to the mental preparedness question. A frequency analysis of these wording varieties within the three key themes revealed five sub-categories: ability to maintain emotional control (theme 1a); understanding of conditions that lead to psychological strain (theme 2a); knowledge that psychological strain may be

encountered (theme 2b); ability to implement a prepared and practiced plan (theme 3a); and, knowledge of when to implement a plan (theme 3b). These sub-categories define different aspects of mental preparedness. A matrix query was used to explore how much emphasis is placed on each aspect of mental preparedness overall (Figure 2), and if answers differ depending on the gender (Figure 3) and age-group (Figure 4) of survey respondents.

Figure 2: Mental preparedness categories identified in survey responses.

Three points stand out in Figure 2. First, all survey respondents (100%) emphasised the importance of being able to implement a prepared and practiced plan (3a). This reflects the practical aspects of preparedness emphasised in passive wildfire risk communication. However, only 30% of respondents stressed the ability to implement an organised plan in a timely manner – *e.g.* when to act, when to evacuate, *etc.* (3b). Secondly, the majority of survey respondents (87%) emphasised the importance of being able to maintain emotional control to aid calm, objective and decisive decision-making (1a). This is arguably a reflection of the survey sample's overall experience of how intense and unpredictable wildfires can be. Thirdly, direct personal experience of the psychological strain encountered during a wildfire (2b) and understanding of the conditions that lead to this psychological strain (2a) were given the same emphasis by survey respondents (~60% each). This highlights the importance of incorporating psychological components into wildfire risk communication and education.

Figure 3: Mental preparedness categories by gender.

Three trends are also evident in Figure 3 when examining differences in perceptions of mental preparedness by gender. First, more female (93%) than male (82%) survey respondents emphasised the importance of being able to maintain control emotionally (1a). Secondly, more men (71%) than women (56%) placed emphasis on a detailed understanding of the conditions that lead to psychological strain (2a), while ~60% of both male and female respondents emphasised the importance of knowing that psychological strain may be encountered (2b). Thirdly, while women placed greater emphasis than men on all aspects of being prepared (3a and 3b), both female and male respondents rated the ability to implement a prepared and practiced plan (3a; 96% and 79% respectively) much higher than the timeliness of implementing different aspect of a plan (3b; 40% and 27% respectively), which is consistent with the findings in Figure 2.

Figure 4: Mental preparedness categories by age groups.

Three trends also emerge when examining differences in perceptions of mental preparedness by age, although the overall differences between each age group are small (Figure 4). First, all respondents rated emotional control highly (1a), with the 50-64 year olds having the lowest rating (80%) compared with the three other age-groups (from 95%-100%). Secondly, the 35-49 and 50-64 year olds placed much greater emphasis than the 20-34 and 65-74 age groups on understanding the conditions that lead to psychological strain (2a; 80-84% vs. 17-20%). The 20-34 and 65-74 year olds instead placed greater emphasis than the 35-49 and 50-64 age groups on knowing that psychological strain may be encountered (2b; 80-83% vs. 48-68%). Thirdly, all age-groups placed high importance on being able to implement a prepared and practiced plan (3a; from 83-100%), although similarly to Figure 2, all age-groups also placed noticeably less emphasis on the ability to implement an organised plan in a timely manner (3b) (from 20%-42%).

5. CONCLUSION

Communicating the need to be ‘well prepared’ for wildfire is straightforward in theory – providing information to individuals at-risk who then act in response. However, as demonstrated in this paper, communicating the practical *and* mental

aspects of being 'well prepared' is complicated: it is difficult to communicate coherently, and difficult to enact. The analysis of survey respondents' perceptions of what it means to be mentally prepared alone revealed three key thematic aspects and five sub-categories that all define different aspect of mental preparedness. While the consistent reference by all survey participants to the importance of being able to implement a prepared and practiced plan reflects the practical aspects of preparedness emphasised in passive wildfire risk communication, it is important in the context of mental preparedness because psychological processes mediate the acquisition of information and consequent actions. The two other thematic aspects more directly relate to the concept of mental preparedness, in the obvious advantages gained from a detailed understanding of the psychological strain of wildfire and the ability to maintain emotional control under duress. These two themes are arguably a result of the survey sample's overall level of experience of how intense and unpredictable wildfires can be. The participants' experience, in turn, highlights the importance of incorporating psychological components into wildfire risk communication to those with little or no personal experience of wildfire.

Understanding the direct role of wildfire management agencies in controlling and combatting wildfires is straightforward. Their indirect role in managing wildfire through the moulding of 'well-prepared' men and women through risk communication is a more complicated process. The findings presented in this paper demonstrate that agency resources could be utilised more effectively if greater emphasis was given firstly, to ensuring risk messages are well understood and coherently communicated by those in charge of disseminating such information to others. The survey sample represents an engaged and informed section of the population in southeast Australia with regards to wildfire, in the context of their employment or voluntary commitment to managing and fighting wildfires. The fact that the participants in this sample struggled to accurately interpret 'basic' wildfire risk messages, and to conceptualise and communicate what it means to be mentally prepared for wildfire, is an important lesson to learn to improve risk communication with members of the general public, who are often less engaged or less informed about wildfire.

Secondly, it is important that wildfire management agencies invest in risk engagement and education mechanisms that empower through the provision of context-specific

risk information that helps people to understand how physical *and* mental preparation can yield positive benefits. This can provide an impetus that overpowers factors that otherwise inhibit protective action. The paper highlights that individuals' interpretation of risk messages often renders passive, mass communicated messages meaningless. Meaning is instead derived for the individual through contextual relevance and understood validity (or trust in) of the advocated actions or measures. The paper also highlights a gendered dimension to perceptions of what mental preparedness means, which resonates with broader issues of gender, risk and vulnerability increasingly emphasised in natural disaster research [54, 68-71].

The current lack of a clear definition of 'mental preparedness' in wildfire risk information increases the inability of wildfire agency staff and volunteers sampled in this study to clearly relate to and articulate (and thus to enact) what exactly being 'well prepared' means. This missing half (mental) of the 'well prepared' equation (physical *plus* mental) impedes the wildfire resilience levels of both the disseminators and the recipients of risk communication, and arguably negates the recommendations made by the 2009 Victorian Bushfires Royal Commission [15] towards building communities truly 'well prepared' for wildfire. The empirical evidence presented in this paper highlights the need for more in-depth qualitative research to better understand and engage with the conception and application of mental preparedness. It also highlights the need for wildfire risk communicators to direct more attention towards encouraging and assisting the development of mental preparedness for wildfire.

ACKNOWLEDGEMENTS

We are grateful to the New South Wales Rural Fire Service for allowing us to conduct the survey with their staff and volunteers at the 2010 Australasian Community Engagement and Fire Awareness Conference. Thank you goes to all survey participants for their time and contributions to the research project, to Dash Weidhofer for assistance with data entry and preliminary data analysis, and to the four anonymous peer-reviewers for constructive comments.

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