Background briefings on emerging issues for fire managers from AFAC and Bushfire CRC.

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FIRE NOTE

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CHILDREN'S KNOWLEDGE OF BUSHFIRE HAZARDS

▲ In 2009, AFAC partnered with 3D animation company Ettamogah to develop the Li'l Safety Club – a children's bushfire education campaign for television, radio and internet. **See Page 3: How the research is being used.**

SUMMARY

As fire agencies and governments move further toward community-based approaches to hazard management, the need for effective school-based education programs is paramount. By studying how children understand and learn about bushfire risk, this research has developed an essential framework for the development and delivery of child-centred bushfire education programs that accommodate children's perspectives and capitalise on their capacities to contribute to reducing bushfire risk at school, at home, and in the wider community.

The research challenges the notion that children lack the abilities to participate in bushfire hazard management: rather, when provided with the opportunity to engage in fire-related discussions and activities that respect their perspectives and capacities, they are able to comprehend many of the concepts and processes that reduce bushfire risk. As such, children represent an important, albeit currently under-used, resource for the development of resilient households and communities.

ABOUT THIS PROJECT

This was PhD research conducted under the Community Self Sufficiency program.

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CONTEXT

This research investigated children's knowledge of the conditions and processes that create bushfire hazards, as well as the actions that can be taken to manage them. It also investigated the role of psychological and social processes in the development of their knowledge.

BACKGROUND

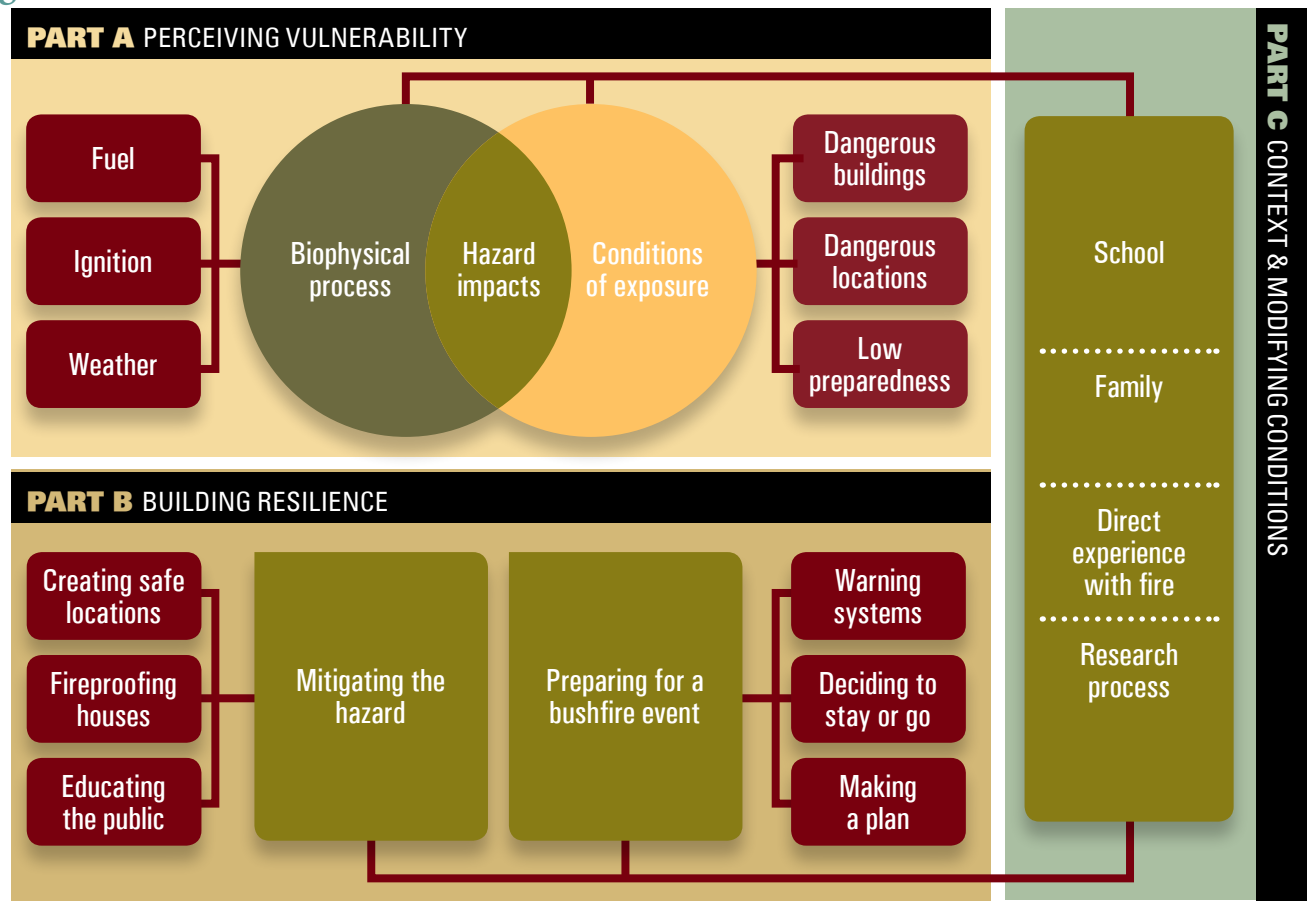
In the wake of the Black Saturday bushfires disaster, the 2009 Victorian Bushfires Royal Commission recommended that "Victoria [should] lead an initiative of the Ministerial Council for Education, Early Childhood Development and Youth Affairs to ensure that the national curriculum incorporates the history of bushfire in Australia and that existing curriculum areas, such as geography, science and environmental studies include elements of bushfire education" (Teague, McLeod & Pascoe, 2010, Recommendation 6). However, as the extensive literature demonstrates, the success of any hazards education program depends on the extent to which it accommodates the knowledge, perspectives, and experiences of the learner (Twigg, 2004; Wisner *et al.*, 2004).

This represents a significant issue for the development of children's bushfire education because children's knowledge and perspectives have been largely overlooked by the bushfire research community, both in Australia and internationally. This research addresses this critical gap by investigating how children living in high fire risk areas in south-eastern Australia understand bushfire hazards. In doing so, it provides an important framework for the development of bushfire education programs that accommodate children's perspectives and capitalise on the psychological and social processes that promote knowledge development.

BUSHFIRE CRC RESEARCH

Historically, researchers in the hazards field, and the social sciences more broadly, have studied children's knowledge through quantitative surveys or by collecting data from

Figure 1



people "close" to them, such as parents or teachers. Over the last several years, however, these approaches have been the subject of a powerful critique because they do not permit children's own perspectives to emerge from the research process – that is, children do not have an opportunity to describe the world as they see it from their own unique vantage points. The importance of privileging children's perspectives has been championed by a new movement in child research known as "the new sociology of childhood" (James & Prout, 1997). Interestingly, this movement finds a parallel in the "vulnerability perspective" on hazards and disasters, a research tradition which recognises the value of studying hazards and disasters from the perspectives of people who live them as part of everyday life (Hewitt, 1998).

Taken together, the new sociology of childhood and the vulnerability perspective provided a strong theoretical and methodological basis for this research, which involved semi-structured interviews with 131 children, aged from five to 12, in high risk locations in Victoria (Macedon, Warrandyte) and Tasmania (Huonville, Bothwell). Through the use of child-friendly qualitative research methods, such as group discussion, drawing, structured scenarios and puppet play, children were able to articulate their knowledge of the conditions and processes that create bushfire hazards as well as the conditions and processes that mitigate or prevent them.

Interview data was then analysed using rigorous "grounded theory" coding methods (Glaser & Strauss, 1967), until clear categories began to emerge. These categories were then further developed and refined through additional interviews and analysis. This process culminated in the development of a model which closely represents children's knowledge of bushfire hazards.

Across the hazards and disasters literature, this is the only model of its kind and provides a crucial framework for the development of children's bushfire education programs in Australia.

END USER STATEMENT

"AFAC worked with CFA to develop ten 30-second "safety stories" about being prepared for bushfire, using the Li'l Larikkins characters, owned by Ettamogah.

"The objectives of this project were to help children better understand bushfires through developmentally appropriate, entertaining stories; provide children with age appropriate actions that they can do or discuss with parents/adults; and provide a vehicle to stimulate discussions between children and parents/adults about bushfire behaviour.

"Briony's research was used to underpin the storylines, with each following the same formula – identify the risk; dispel any misconceptions children may have; provide information for a more accurate understanding; and encourage children to take age appropriate actions and talk to parents/adults.

"In 2010 AFAC worked with SES agencies nationally to develop a Natural Hazards Children's Awareness and Education program. Ten safety stories were created using the Li'l Larikkins characters, based on the formula developed for the CFA stories that was underpinned by Briony's research. The aim was to increase children's awareness of the potential dangers inherent in floods, storms, cyclones, tsunamis and other natural hazards. The program has received two national awards – Nationally Significant Category Winner in the 2011 Australian Safer Communities Awards presented by the Commonwealth Attorney General, and Best Primary Education Video Resource in the 2011 ATOM (Australian Teachers of Media) Awards."

– Amanda Leck, AFAC Campaign Manager

A drawing produced by a six-year-old research participant at Warrandyte, Victoria.

Note: The data collection for this research was completed in December 2008. Thus, children's knowledge and understanding had not been affected by the high profile Black Saturday bushfire disaster of February, 2009.

RESEARCH OUTCOMES

The framework representing children's knowledge of bushfire hazards has two major categories: (1) **perceiving vulnerability**; and (2) **building resilience**.

Perceiving vulnerability represents children's knowledge of the conditions and processes that create bushfire hazards. Children understood vulnerability to bushfire hazards as a function of three separate but interrelated sub-categories. The first sub-category, *the biophysical process,* represents the conditions and processes that facilitate bushfire activity in the natural environment: namely, fuel, weather, and ignition. The second sub-category, *conditions of exposure,* represents the various conditions and processes through which people and property are exposed to the biophysical process: primarily, by living in dangerous locations or dangerous houses and not being prepared. The third sub-category, *hazard impacts,* represents the range of adverse consequences that arise when *the biophysical process* interacts in time and space with *conditions of exposure*. The most common hazard impacts identified by children included death or injury, property damage and environmental degradation (See Part A, Figure 1).

Building resilience represents children's knowledge of the conditions and processes that reduce or prevent hazard impacts. Building resilience comprised two sub-categories. The first, *mitigating bushfire hazards* involved three main activities: 1) creating safer locations by creating fuel breaks and undertaking general fuel management; 2) fireproofing houses by either rebuilding or retrofitting; and 3) educating the public about preparedness and emergency response. The second sub-category, *preparing for a bushfire event* also involved three main activities: 1) establishing warning systems by way of environmental cues, sirens and alarms, or social networks; 2) making a decision to stay or go based on factors such as the value of the property and the resources that are available to defend; and 3) formulating a plan to stay and defend, shelter in place or evacuate (see Part B, Figure 1).

While the rigour of the analytic coding process ensured that children's knowledge of bushfire hazards was adequately represented by the categories in the model, it must be emphasised that the sophistication of children's knowledge within each category and sub-category varied substantially. For example, within the sub-category of *preparing for a bushfire event*, children's plans to stay and defend often belied a somewhat naïve understanding of the task with many children suggesting that they would try to stop the fire front from reaching the house before fleeing at the last minute. However, there were several children who articulated a more sophisticated understanding of staying to defend, suggesting that they would extinguish embers around the house as the fire approached, take refuge inside the house as it passed over, and return outside to continue extinguishing spot fires after it had passed.

A major finding of the research was that the variation in the sophistication of children's knowledge could be explained by four key contextual and modifying conditions: 1) direct experience with fire in the environment; 2) fire-related discussions and activities at school; 3) fire related discussions and activities at home; and 4) participation in the focus group interview itself (see Part C, Figure 1). Put simply, when children had been given the opportunity to participate in bushfire-related discussions and activities, they had been able to develop accurate, detailed knowledge of bushfire hazards.

Does the research validate/challenge current practice?

This research challenges the notion that children lack the intellectual capacity or agency to understand or communicate bushfire hazards. It demonstrates that when children are given opportunities to engage in genuine discussion and participate in constructive activity, they are able to build a detailed, accurate understanding of both the conditions and processes that create bushfire hazards and the actions that can be taken to manage them. Thus, children represent an important target group for bushfire education programs. The value of targeting children is further highlighted when we consider the powerful influences they exert on the knowledge, attitude and behaviours of their parents. Through a series of in-depth interviews with parents in each of the study locations, it was revealed that their decisions to plan and prepare for bushfire were often a result of having children in the home or of having risk-related discussions with their children.

HOW THE RESEARCH IS BEING USED

As they seek to fulfil Recommendation 6 of the 2009 Victorian Bushfires Royal Commission, various emergency management agencies and government departments have utilised the research to enhance the effectiveness of their bushfire education programs for children.

The readiness of agencies and departments to utilise the research is testament to the need for bushfire research that focuses on children's experiences and perspectives.

In 2009, the Australasian Fire and Emergency Services Authorities Council partnered with the Country Fire Authority and 3D animation company Ettamogah to develop the *Li'l Safety Club* – a children's bushfire education campaign for television, radio, and internet. This research provided an evidence base for the development of ten 30-second safety messages that were screened across all free-to-air channels across south-eastern Australia during children's viewing time over the 2009/2010 bushfire season.

In 2010, the research was used for the development of a bushfire preparedness scenario for the *Triple Zero Kids Challenge*, an award winning online safety game for children. In developing the script for the scenario, Fire and Rescue NSW drew heavily on the research to ensure that the game would accommodate the knowledge and misconceptions of children. The game is available at http://kids.triplezero.gov.au

Most recently, in 2011, the research was used by the Victorian Education Department for its *Bushfire Education Curriculum*. The department drew on various elements of the research, particularly the findings relating to children's misconceptions about bushfire behaviour.

Each of the projects outlined here represents a new approach to children's hazards education – an approach which recognises the importance of accommodating the unique perspectives of children and capitalising on their capacities for knowledge and action.

COMMON CHILD MISCONCEPTIONS ABOUT BUSHFIRE HAZARDS

Across research locations, children articulated a number of common misconceptions about bushfire hazards which will need to be explicitly addressed by bushfire education programs. Some of the most common misconceptions included:

- Bushfires can ignite spontaneously as a result of the sun shining on trees, leaves or other combustible fuels.
- A bushfire spreads from one fuel source to another via a chain of direct flame contact. If fuel sources are too far apart to facilitate direct flame contact, the fire will not progress any further.
- Rivers, roads, metal fences and other non-flammable entities can impede or obstruct the chain of direct flame contact, thereby preventing a fire from spreading towards the house.
- If trees, bushland or other fuel sources are not touching the house, there is no potential for ignition via direct flame contact and the house is safe.
- Brick houses never burn down while wooden houses usually do.
- The fire brigade will always be available to protect houses under threat.
- If you decide to evacuate, you should pack up your belongings and wait for the fire to reach the property before leaving.
- If you decide to stay and defend, you should do your best to extinguish the fire front before it reaches the house: if this can't be achieved you should evacuate at the last minute.
- Bathtubs and swimming pools are appropriate places to shelter from a bushfire.
- It is possible to outrun a bushfire on foot.

FUTURE DIRECTIONS

This research sets out a number of important issues that should be the focus of future research.

The first relates to the extent to which children utilise their knowledge to undertake risk reduction activities in their homes and communities. Future research should examine the extent to which children's knowledge translates into action and identify the psychological and social factors that facilitate or impede that process.

The second relates to the extent to which bushfire education for children affects levels of knowledge and action in the long-term.

For example, to what extent does education in primary school promote long-term generational and cultural change in high bushfire risk communities?

The third relates to the knowledge and perspectives of adolescents. As bushfire education will also be incorporated into the secondary school curriculum, it will be important to investigate how adolescents understand bushfire hazards so that their knowledge and perspectives can be accommodated in the education process.

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AFAC is the peak representative body for fire, emergency services and land management agencies in the Australasia region. It was established in 1993 and has 35 full and 10 affiliate member organisations.