



In the Heat of the Moment: Householder Decision Making Under Bushfire Threat

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Not surviving a bushfire

Evidence presented to the 2009 Victorian Bushfires Royal Commission is consistent with fatal choices made under extreme stress being associated with up to 22 fatalities (18 adults, 4 children) in 8 separate incidents.

See: 2009 Victorian Bushfires Royal Commission FINAL REPORT VOLUME I THE FIRES AND THE FIRE RELATED DEATHS pages 238-332; and relevant hearing transcripts]

Common causes of bushfire-related householder deaths

Heat-Related	'Smoke'-Related	Trauma-Related
Damage to airway tissue due to convective heat Hyperthermia due to radiant heat Burns injury complications	Carbon monoxide poisoning Airway tissue damage by irritants	Vehicle-related impacts Crushing by falling trees/branches

Surviving imminent bushfire threat

Of 483 survivors of the 2009 Black Saturday fires interviewed by the Bushfire CRC Research Task Force, 47 survived 'severe' to 'extreme' levels of threat to life. Almost all did so by 'keeping their heads' despite their dangerous situation:

- they down-regulated their fear/anxiety**
- they maintained their focus on threats to life and responding adaptively to these threats.**

[See: Australian Journal of Emergency Management, 2011, volume Vol. 26 No. 2, pp. 41-46]

--Decision making (?) under imminent bushfire threat

..ringing my husband at work and I was just in a mad panic. I just said to him—I was trying to say what I had to say and I could hardly speak...I'm just saying *'Tell me what to do! I don't know what to do, tell me!'-- You can't think.—'There's a bushfire close'*—I said, *'It's coming and just getting closer and closer'*...He said 'grab the dog, and get out, now'! [Interview following the Lake Clifton, WA, Fire 10-01-2011]

--Decision making under imminent bushfire threat

Things were exploding...it was a war zone...the house was obviously going up...I dragged the kids out in the yard...the kids had bare feet...there's a dry dam up the back...we laid down there...no, we had nothing to cover us, no time...we all copped burns, from embers and stuff ...the SES got us to hospital, the kids had to be on oxygen...

When we got back the house was OK, just a few burns on the roof. [Interview following the 'Black Saturday' fire, Bendigo, VIC 07-02-2009]

---Add the preceding to numerous anecdotal accounts of survivors' experiences during a range of disaster situations—including bushfires-- and it seems clear that stress can play a significant role in survival versus non-survival.

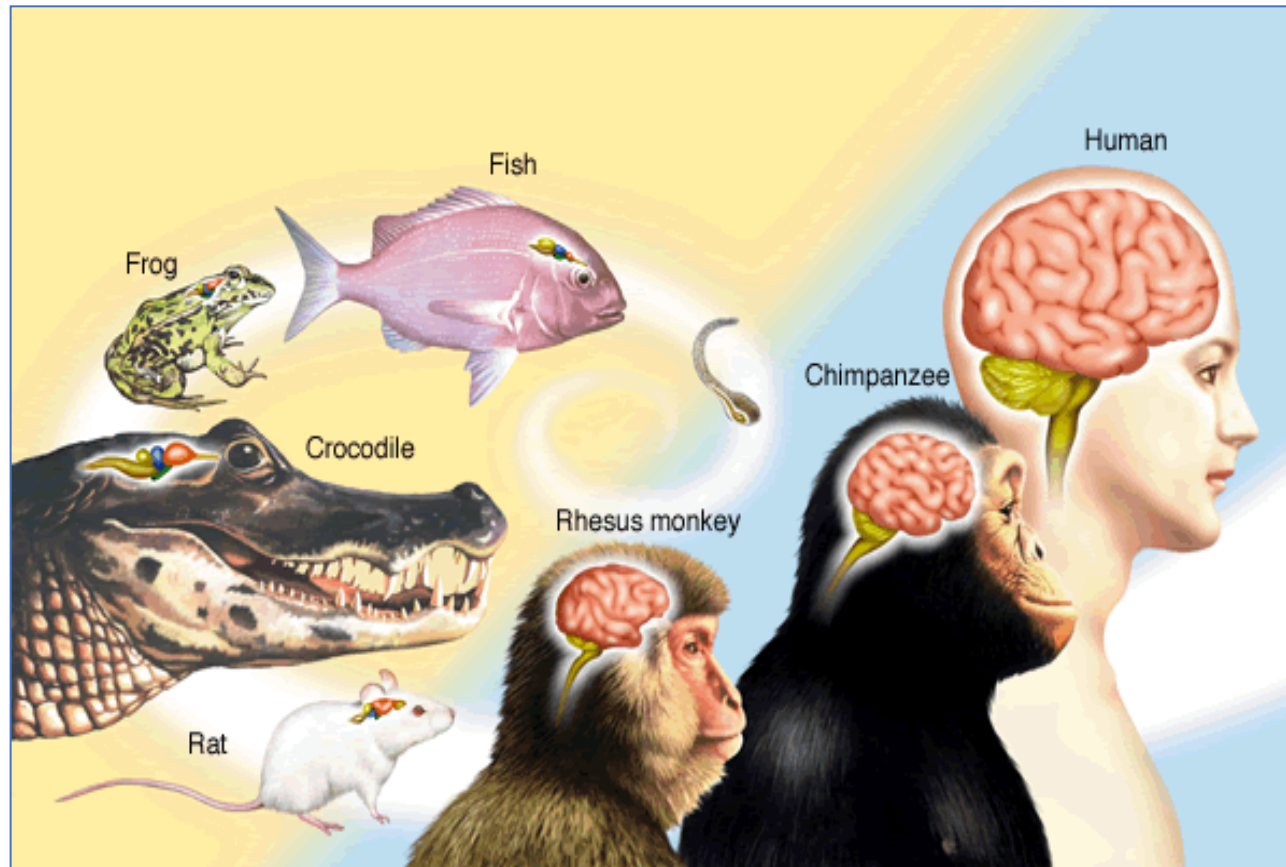
BUT HOW?

In researchers' dreams! Imagine:

A. N. Other, U. N. Owen, & J. O. King. (In Preparation).
Controlled experimental laboratory investigations of the effects of stress on bushfire survival-related decision making by civilians. *The Journal of Unobtainable Wildfire Research*.

--sadly, this has yet to be published!!!

*We are, in some respects, baboons
who wear clothes and use words...*



Feature	Human Weaknesses	Human Strengths
Memory	<ul style="list-style-type: none"> Limited working memory Gaps in memory 	<ul style="list-style-type: none"> Ability to store and retrieve a large amount of experience We can use tools such as metaphors and mnemonics to tap into information
Thinking	<ul style="list-style-type: none"> Limited speed of thinking Shortcuts in thinking 	<ul style="list-style-type: none"> Recognize our emotions Think about our thinking (meta-cognition) Think about other's people thinking Ability to anticipate and forecast Intuitive and analytical ways of thinking
Relating	<ul style="list-style-type: none"> Group think Exclude out-group members from process Interpersonal conflict 	<ul style="list-style-type: none"> Clarify understanding Establish trust Communicate efficiently Co-ordinate joint actions
Emotions	Over-ride, cloud, distort, or bias information	Can provide intuition about early dangers or solutions

Gaining understanding indirectly from stress research

Research into the effects of stress on human performance.
Extend this to civilians in bushfires?

- **Some definitions and distinctions -**

1. Stressor: the **source** of threat.

2. Stress: the psychological **impact** of the threat-situation.

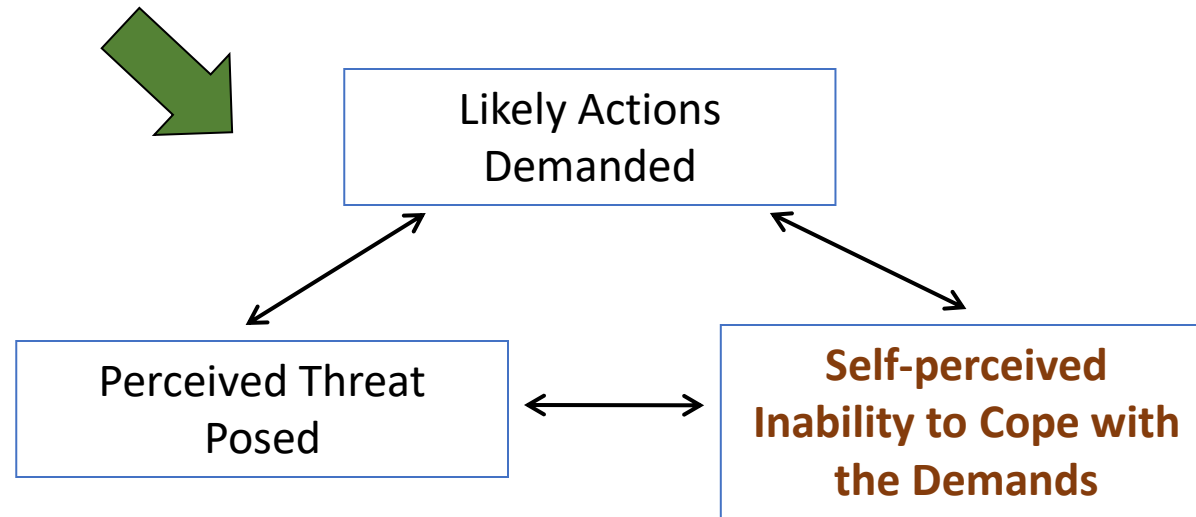
- **Distinguish:**

- Stress, a **negative mood state**, from

- Arousal –**activation**, or **energisation**.

The transactional model of stress

Threat



Stress

General reviews of stress and human performance research

Stress has negative effects on:

- 1. Perceptual-motor skills performance.
- 2. Attention control.
- 3. Memory.
- 4. Reasoning, judgement & decision making.

Q: But many different stressors used in the research – how relevant are the findings in relation to bushfires?

A: Select research studies involving potential threat of pain, injury, death.

Perceptual-Motor Skills Performance

5 studies: parachutists, divers, rock climbers, sport science students.

Average mean decrement 29% -

- Emerging threats may be overlooked.
- Tasks may take longer.
- Mistakes may be more likely.
- **–Clumsiness may strike!**

During 'Black Saturday' at Horsham, Victoria

I suddenly noticed that the ash was starting to drop around...so I came over here to get my car and backed out and swung around here to hook up the fire trailer...I looked up as I backed the trailer and I noticed a line of flame ...at the back of this paddock, shit!...So I started to try and hook the trailer onto the car, and I was having big trouble trying to get it on...I just couldn't seem to get it lined up to lock. I had to give up on the trailer and just leave.

Attention Control

**4 studies: firefighters, rock climbers, divers, students.
Average mean decrement 39% -**

- Attention may become narrowly focussed on only a few obvious aspects of the threat situation and miss the potentially deadly threats.
- It may be hard to concentrate and negative distracting thoughts keep getting in the way.

During the Lake Clifton Fire

So it was like 'What do I do Mum?' ...Yeah, it was one of those things like 'NO!'.I'm thinking it's going to be bad...and I thought because I'm here on my own I've got to take charge, but I felt like I wanted someone to say 'Angela, just do THAT!!'

--Do you know what I mean?

Memory

4 studies: army recruits, parachutists, maritime college students: Average mean decrement 33% -
(the ditching study!)

- It may be difficult to keep important things in mind that you have to do.
- It may be hard to remember survival-related information—like driving directions to safety!

Following the Lake Clifton Fire

- *Interviewer:* Did you put the sprinkler systems on?
- *Interviewee:* No, I didn't actually. I was on the phone all the time...I got to the car, dropped the phone in the car and I just went! Later, I thought 'Shit! I didn't do that!' And we lost the house.

Reasoning, judgement and decision making

5 studies: army recruits, parachutists, students: Average mean decrement 21% -

(the artillery shoot study!)

- Information may be misunderstood--like warnings on ABC local radio.
- Better alternatives may be overlooked—like parking on ploughed paddock rather than keep driving through a forested area
- It may be hard to think things through so as to take the best course of action.

During 'Black Saturday' at Hazelwood, Victoria

Do you know what I did? Like, the embers were hitting me quite forcefully, because the wind was so high, and I was completely exposed, standing on the windward side of the house with the hose. I just stood there, and I thought 'Shit!'. All of a sudden, you know, the heat of the fire, I couldn't breathe and the smoke was everywhere...I put the hose over my head because I was so hot and ducked round the back. And later I thought God, that was really dumb'.

Implications: (1) Community education

- 1. Raise awareness – inform, educate.
- 2. The importance of a household bushfire plan.
- 3. Practice and rehearsal—conversational is better than none!
- 4. A pre-mortem.
- 5. Preparation, not last-minutation!

Implications (2): Incident management

- Keep “**the stressed civilian**” in mind.
- Factor “**stressed civilians**” into planning and training exercises.
- Maintain a “**stressed civilian**” focus, especially in relation to evacuations.

Implications (3): Warnings

- Timely – think ‘LATENCY’: the delay before residents actually leave.
- Brevity
- Clarity
- No ambiguity

THANK YOU FOR THE OPPORTUNITY TO PRESENT!

If there are questions or comments I will
do my best to respond.

I can always be contacted by email at
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