Human Behaviour

When Disaster Strikes: Human behaviour in emergency situations

By S. J. Robinson and T. D. Higgins; School of Psychology, University of Central Lancashire, Preston, Lancashire, England. PR1 2HE.

When disaster strikes and emergency warning sounds or the captain orders an abandon ship we hope people will remain “cool, calm and collected.” Being level-headed during a life-threatening event is highly prized and undoubtedly improves your chances of survival. However, anecdotal reports and the limited psychological research available suggest that people under threat can actually act in a way that puts themselves and others in further danger. This article discusses some of the unhelpful behaviours which can happen during emergencies and notes some interventions which might stop them.

Behaviours during a disaster

People can behave in an appropriate manner during an emergency. In good conditions, with no pressures on resources or time, calm and orderly responses are likely. Even in more chaotic situations quick thinking and effective actions can lead to positive actions. For example, during the sinking of the Costa Concordia cruise ship in January 2012 eyewitnesses reported many instances of constructive behaviour. Some passengers used iphone apps to work out their location on the ship while others made ladders from sheets to reach the safety of the next deck. However, research suggests that only 10-25% of people in an emergency will be able to undertake prompt and effective action. Other disaster victims (approximately 65-80% of people) will become indecisive and act in a stunned and bewildered manner. The remaining 10-15% of victims will display serious maladaptive behaviour, including confusion, crying, paralysing anxiety and hysteria1. Again these types of behaviour were seen onboard the Costa Concordia, with people passively standing by or running aimlessly up and down the stairs2. So why do these types of behaviours occur?

Denial

One of main reasons people fail to respond to danger is because they enter a state of denial. Past experiences of false alarms or inaccurate disaster warnings can lead people, quite rationally, to believe actions are not really needed. For example, during the 1990 Ephrata, Pennsylvania chemical fire 82% of those involved failed to evacuate. Based on previous experiences workers felt that the fire would not affect them directly. However, some people reported later than they were so close to the fire that they had burn holes in their jackets.3

Denial can also be more likely if people do not trust the source of the disaster warning. Aboard the Costa Concordia for instance one passenger initially did not believe that the ship was sinking as the warning had come from “a dancer and they do drama.”2

Another reason that people do not respond to disaster signs is that they do not want to deviate from what others are doing. Humans are very social creatures and we tend to take our lead from other people. If the majority of people are not responding to warning signs then we will tend to conform to that behaviour and follow their lead - no matter how dangerous it is. For example during a fire at

a restaurant diners continue with their meal as if nothing was wrong. One diner even commented that “it was a bit uncomfortable really. The smoke and the sirens of fire engines.”4

A further reason people do not respond to threat is that they simply do not know what to do. In daily life we have a number of pre-planned behaviours (schema) which we draw on. For example, we know how we should behaviour when we are attending a posh dinner party compared to how we should act during a meal at a fast-food restaurant. When people experience a novel situation (such as being in a disaster) they do not have a schema available and so need to generate a new behaviour. Under normal conditions creating a new behaviour is feasible, however under threat it becomes more difficult due to time pressures.

Therefore in a disaster we may see either

1) no behaviour generated so people appear to freeze5, or,

2) inappropriate or stereotypical behaviours occurring when people use pre-existing but unsuitable schema.6

Freezing

During disasters freezing (also known as cognitive paralysis6) is commonly seen as people struggle to generate new appropriate behaviours. For example during the Hillsborough football stadium disaster in 1989, one eye witness reported seeing a policeman failed to help a girl who was being crushed to death. The eyewitness stated that “the copper in front of us was just looking. I shouted at him to do something but he just sort of looked blank”.7 Similar stunned behaviour has been reported in many disaster situations from fires to flood.

Stereotypical behaviours

Sometimes during disasters people can avoid freezing by engaging a pre-existing schema. Although using well rehearsed actions is less cognitively demanding it can result in some less than ideal behaviours. For example, when evacuating from a building during a disaster people may pass by the emergency exits as they use their normal pre-planned exit route.8

Similarly during the 11th September 2001 attacks on the World Trade Centre people took the time to shut down their computers before exiting.9 As the victims did not have a pre-planned schema for leaving under emergency conditions they implemented their normal “leaving” behavioural schema, which included the switching off of their computers.

Inappropriate behaviours

As well as carrying out stereotypical behaviours people in threat situations can also make poor decisions which lead to inappropriate actions. Disasters are time-pressured and victims can be faced with a large amount of ambiguous, incomplete and novel information. Experimental studies have clearly shown that under these types of conditions people are more likely to make errors in judgement.10 Obviously, poor decision making in a life-threatening situation can increase the risk of injury or death. Examples of inappropriate decisions during disasters are common. For example during the Japanese earthquake in March 2011 BBC footage showed people in a supermarket

running to save bottles of alcohol from smashing rather than carrying out the correct earthquake drill.

The impact inappropriate behaviour can have on survival was highlighted by a study which monitored civilian admissions to emergency rooms in Israel after Iraq's invasion of Kuwait in 1990. The study found that out of the 1059 people who reported to emergency rooms only 234 (22%) of people had injuries that were the direct result of a missile explosion. The remaining 78% of admissions were the result of inappropriate behaviour during the missile attack. For example 230 patients had auto-injected atropine without exposure to a chemical agent. A further 40 patients had injured themselves running into their sealed room and seven suffocated because they had left the filter closed on their gas masks.11

Memory failures

Disaster victims often report failures in memory under threat. Some memory slips are normal everyday lapses but during an emergency they have greater consequences.12 For example, failing to remember where you left your front door keys on an average Monday morning is inconvenient. However, forgetting where you have left your keys during a fire will have more serious implications. Other memory problems experienced during disasters can be more marked. For example during a house fire in 2010 a women failed to tell fire-fighters that to her grandson was asleep in the burning house because she had forgotten he was staying over.13 Similar cases include a nun who could not remember the school address where she worked when she phoned the fire brigade during a fire.

One theory as to why victims of disasters have memory problems is that the body releases high levels of the stress hormone cortisol which in turn can affects parts of the brain which are responsible for memory processing. Another theory is that the worry and anxiety caused by the disaster occupy the area of the brain responsible for processing memories. Whatever the reason, it is clear that memory failures during disasters can cause people to forget how to use emergency equipment or how to follow emergency procedures.14

Holding it together until rescue

One interesting observation of disaster victims is that some are able to take prompt and effective manner under threat but at the point of rescue become dazed. Lauren Elder, for example, survived an airplane crash on the High Sierra, walked down a mountain and through the desert to a town. Upon arrival at the hospital she became unable to walk and fell into a stupor.15 Similar collapses were seen the Chilean mine survivors who acted in a rational manner while trapped underground but became stunned and dazed upon rescue.16 Similar collapses in cognitive functioning have been observed in fire-fighters following a simulated search and rescue exercise at Fleetwood Nautical College.

Implications and Interventions

We can never guarantee that people will behaviour appropriately during an emergency and many variables can affect how well people respond. Age, gender, past experience, level of school education are some of the factors which can govern how well people respond. Situational factors, such as the intensity with which the victim experiences events, are also important. Some people may

be trapped under rubble after an earthquake for many hours, whereas others further from the epicentre may escape without injury.

Below are some key observations which may help people working in emergencies. In addition I have noted some suggestions which may increase appropriate behaviours during life-threatening events and so could improve survival:

- Emergency service personal should be aware that they will see a marked variation in the way people respond to threat. Interestingly some have observed that people who appear confident and in control in daily life can be more likely to fall apart during a disaster.
- False alarms and inaccurate information should be avoided at all costs as they can reduce compliance with future disaster warnings.
- Emergency warning messages should come from a credible source to increase the likelihood that they will be believed.
- People will tend to behave in a similar manner to the people around them. It can be a real challenge to get people to evacuate for example if those around them are not moving. If you can get a few people to start behaving in an appropriate manner then it is likely that others will follow their lead.
- Developing schema via realistic training in emergency equipment and procedures can reduce freezing and stereotypical behaviours.
- Training can also increase confidence and as a result people are better able to keep their emotions in check during a disaster. Reduced anxiety has also been shown to improve memory functioning and so victims may be more likely to remember how to use equipment and undertake emergency drills.
- Anxiety caused by a disaster can increase the release of the stress hormone cortisol. Cortisol is known to impair mental processes such as memory. However, cortisol can be reduced with nutritional interventions such as L-theanine (which is found in tea) and sugar. So the theory that all you need is a little sit down and a hot cup of sweet tea to help you recover might actually be true!
- Emergency service workers should be aware that people can seem to be functioning normally during the disaster. However some people may suffer a cognitive collapse shortly after rescue.

References

1. Leach, J. (1994). Survival Psychology. London: MacMillan Press Ltd.
2. ABC News. (2012). Cruise Ship Survivors Share Stories Both Harrowing and Hopeful. http://news.yahoo.com/cruise-ship-survivors-share-stories-both-harrowing-hopeful-195623964--abc-news.html. Retrieved July 09, 2012.

3. Fischer, H. W. (1994). Response to disaster: Fact Versus Fiction and Its Perpetuation: The Sociology of Disaster, New York and London: University Press of America.

4. Wood, P. (1970). In Canter, D. (1980). Fires and Human Behaviour. London: John Wiley & Sons Ltd.

5. Leach, J. (2004). Why people 'Freeze' in an emergency: Temporal and cognitive constraints on survival responses. Aviation, Space and Environmental Medicine, 75(6), 539-542.

6. Leach, J. (2005). Cognitive paralysis in an emergency: The role of the supervisory attentional system. Aviation, Space and Environmental Medicine, 76(2), 134-136.

7. Newburn, T. (1993). Disaster and After: Social Work in the Aftermath of Disaster. Wiltshire: Cromwell Press Ltd.

8. Bickerman, L., Edelman, P., & McDaniel, M. (1977). A model of Human Behaviour in a fire emergency.NBS-GCR-78-120.National Bureau of Fire Protection.

9. Ripley, A. (2005). How to get out alive. Time, 65(18), 58-62.

10. Ariely, D. and Zakay, D. (2001).A timely account of the role of duration in decision making. Acta Psychological,108, 187-207.

11. Karsenty, E., Shemer, J. and Alshech, I. (1991). Medical aspects of the Iraqi missile attacks on Israel. Israel Journal of Medical Science, 27, 603-607.

12. Gonnzales, L. (2003). Deep Survival: Who Lives, Who Dies and Why: true survival stories of miraculous endurance and sudden death. New York and London: W.W. Norton and Company.

13. MSN news (2010).Woman forgot grandson in house fire. http://news.uk.msn.com/uk/articles.aspx?cp-documentid=153701214. Retrieved July 09, 2012.

14. Robinson S. J., Sunram-Lea, S., Leach, J. and Owen-Lynch P. J. (2008) The effects of exposure to an acute naturalistic stressor on working memory, state anxiety and salivary cortisol concentration. International Journal on the Biology of Stress. 11(2), 115 – 121

15. Elder, L. and Streshinsky, S. (1978). And I Alone Survived. New York: Thomas Congdon Books.

16. Guardian (2011). Chilean miners struggling with financial and psychological problems. http://www.guardian.co.uk/world/ 2011/aug/04/chilean-miners- financial-psychological-problems. Retrieved August 09, 2012.

About the Authors

Dr Sarita J. Robinson is a senior lecturer in psychology at the University of Central Lancashire. Sarita completed her PhD in human behaviour during emergency situations and has been researching in the area of survival psychology for over ten years. Her current research interests include disaster

preparedness, secondary trauma in emergency service personnel, as well as the cognitive and psychobiological changes which occur under threat.

Email: SJRobinson1@uclan.ac.uk

Tom D. Higgins served in HM forces in many countries around the world for the greater part of his adult life. Upon leaving he served as an offshore radio officer until due to ill health curtailed this career. During his recuperation Tom return to education and is currently studying the University of Central Lancashire where he has developed a special interest in survival psychology.