

WHY ARE PEOPLE SO UNKIND? UNRAVELLING COMMUNITY RESPONSES TO FLOODPLAIN AND EMERGENCY MANAGEMENT

Neil Dufty¹, Mel Taylor², Garry Stevens²

¹Molino Stewart Pty Ltd, Parramatta, NSW

²University of Western Sydney, Parramatta, NSW

ABSTRACT

An increasingly important part of floodplain management and flood emergency management involves community consultation and education. In NSW, the floodplain risk management planning process requires community consultation. Community awareness and community readiness are response modification measures that should be considered in floodplain risk management according to the NSW Floodplain Development Manual. Emergency managers such as the NSW State Emergency Service are engaging with communities to attempt to raise flood preparedness levels and encourage appropriate responses to flood warnings including evacuation.

However, research and experience shows that community responses to these initiatives are varied. For example, community interest in floodplain risk management plans can range from non-existent to overwhelming particularly when property values appear affected. Community preparedness levels can remain low even after a flood education campaign. People can remain at home even after evacuation orders are given.

This paper draws on disaster-related psychological research and theory to provide an insight into why communities react in the way they do to floodplain and emergency management initiatives. The research includes that conducted by the Disaster Response and Resilience Research Group from the University of Western Sydney into a broad range of hazards. Based on learnings from this research, the paper examines threat perception, perceived coping and other psychological factors particularly relating to community flood preparedness.

Using the psychological research presented, the paper reflects on current community flood-related consultation and education processes used by emergency managers, consultants, state government agencies and local councils. It then offers several ways to improve the effectiveness of these processes.

INTRODUCTION

Floodplain managers and emergency managers are increasingly being required to interact with flood-affected communities as part of their core business.

Community consultation (a type of community engagement) is an integral part of the floodplain risk management process as guided by the NSW Floodplain Development Manual (NSW Department of Infrastructure, Planning and Natural Resources, 2005). In relation to the formation and implementation of floodplain risk management plans, the Manual states that “broad community involvement in the plan preparation, from the beginning, should produce the best prospect for community acceptance of, and commitment to, the resulting management plan”. More specifically, the Manual promotes the use of “effective community

consultation” for preparation of the flood study that “requires consideration of the following aspects:

- informing the community of the management study and its purpose
- assessing the community’s level of knowledge, understanding and concern in relation to flood issues and flood readiness
- obtaining any information members of the community may have in relation to flood issues and flood readiness
- obtaining any information members of the community may have in relation to historic flood levels, behaviour and responses
- assessing community aspirations in relation to flood problems
- providing the community with information on alternative management measures and the inherent advantages and disadvantages of these
- providing a mechanism for the community to have input into selection of appropriate management options”.

Community involvement is also required in the review of the draft risk management plan and its implementation. The Manual states that “it is necessary that (local) councils actively involve representatives of the community, particularly owners of flood prone land, in the preparation of the management plan and the review of its effectiveness”.

The NSW State Emergency Service (SES) as the NSW emergency agency responsible for floods provides flood-affected communities with education, communications and engagement (ECE) services. This is highlighted in the NSW SES Plan 2011-15 (NSW State Emergency Service, 2011) where under Service Delivery Goal 1 ‘Resilient Communities’ strategic statements are made about ECE services to help communities with prevention, preparedness and response.

Communities are also consulted with and education is provided by various organisations (government and non-government) during the flood recovery phase and as part of post-event learning (e.g. through community de-briefs and meetings).

In summary, the main ‘official’ interactions between government and flood-affected communities are:

1. Flood prevention/risk management. Community consultation by local councils and consultants as required by the NSW Floodplain Development Manual. There are also opportunities to raise awareness of floodplain risk and management options in the implementation of floodplain risk management plans.
2. Flood preparedness. The NSW SES uses a range of ECE methods (e.g. FloodSafe Guides, web site, engagement events) to encourage people to take necessary precautions (e.g. using an emergency kit) and know how to respond appropriately if a flood occurs. The SES promotes the use of household and business emergency plans for preparedness.
3. Flood response. The Bureau of Meteorology and the SES communicate warnings and other information (e.g. regarding evacuations) to communities that could be impacted by flooding.
4. Flood recovery. Government and non-government organisations coordinate flood recovery activities using a range of ECE techniques.
5. Post-flood learning. In some cases, ECE activities are used after an event to improve resilience to future floods.

COMMUNITY RESPONSES TO OFFICIAL INTERACTIONS

There is evidence to show that, in many cases, communities (or sections of communities) do not respond as expected to the five main interactions listed above. They can react with apathy, and sometimes with anger or with total disregard for authority.

There have been numerous consultations conducted by local councils and their consultants for flood studies and floodplain risk management plans in NSW. The responses to these consultations have generally been very poor with only low numbers (less than two per cent of flood-affected residents) involved. Even when potentially contentious sea level rise projections are included in flood studies and floodplain risk management plans, community consultation involvement rates may only rise slightly above five per cent. However, the relatively few people that are involved in the consultation processes can be angry, particularly if they believe their property values are impacted by the results of the flood studies.

The responses to preparedness ECE activities have also not always been as favourable as expected. From several social research studies (e.g. Micromex, 2010), most NSW flood-affected communities only have rates of less than 20% for households with emergency plans. However, those communities with ongoing ECE activities and/or a recent flood history tend to have slightly higher rates for preparation of household emergency plans.

As highlighted by some sections of Brisbane communities in the 2011 Queensland floods, some people refuse to evacuate even after receiving several communications to leave. Several social research studies show that people are reticent to leave their homes. For example, in Grafton, Pfister (2002) found that during the 2001 Grafton floods only 18% of residents who were surveyed stated that they evacuated their homes in response to warnings (only 13% actually evacuated to a safe area). According to the results of surveys undertaken of Grafton and other Clarence Valley residents following the 2009 flood event (Molino Stewart 2009), it appears that a higher proportion of people evacuated in 2009 compared to 2001. During the 2009 flood, 24% of those surveyed from the Clarence Valley said that they evacuated (32% of those who heard the evacuation order), compared to 13% of people who said that they evacuated in 2001. However, approximately 20% of respondents in the Clarence catchment said they would not evacuate in any circumstances.

In Grafton in 2001 the main reason behind those surveyed not evacuating was the belief that they were not at risk. While this was also an important reason why many people did not evacuate in 2009, other reasons given by many respondents for not evacuating in 2009 such as property protection and a lack of trust in the evacuation order, do not appear to have been significant factors for not evacuating in 2001.

Maitland is a regional centre with ongoing ECE activities delivered primarily by the Hunter-Central Rivers Catchment Management Authority and the NSW SES. During the June 2007 floods, 76% of those surveyed in Maitland evacuated from their premises (Gissing, Molino and Cameron-Smith, 2008). However, of those that did evacuate from Maitland during the June floods, only 52% said they would evacuate in the future if they were asked.

Of the 24% that did not evacuate from Maitland in 2007:

- 50% said they did not believe that their building would flood
- 29% did not think there was a great enough threat to personal safety
- 16% stayed to protect their property and possessions from looters
- 16% felt they knew how to manage on their own.
- 13% stayed to protect their property and possessions from floodwaters

- 3% waited for the final order to evacuate with a similar amount saying that they were talked into staying by someone else.

There are also examples of where a small number of people do not heed flood safety messages regularly communicated by the SES such as 'never drive, ride, walk or play in floodwater'. Research shows that people are drowning not because they are trapped, but because they make bad choices (FitzGerald et al, 2010). The research found that "90% of flood-related deaths in Australia resulted from individual choices to either engage in inappropriate risk-taking or enter flooded waterways on foot or in a vehicle". Forty per cent of deaths were associated with driving motor vehicles across flooded waterways or roadways, despite public warnings to avoid them.

Generally, the responses by communities to official interactions after a flood disaster have been more favourable. This is highlighted by the 55,000 volunteers that assisted in recovery after the January 2011 Queensland floods.

However, post-flood learning opportunities can sometimes be missed either by authorities not wishing to engage directly with communities or with engagement primarily being conducted long after the event as part of a formal, drawn-out process such as a flood inquiry. Post-flood community meetings and other types of engagement are generally well-supported by communities if they are held within one month of the event. It should be stressed that there is a balance required with the number of engagement activities in communities after a flood as too many can lead to 'focus group fatigue'.

There can be hostile reactions from communities in post-event engagements. These reactions can include anger at flood predictions not being accurate, 'unwarranted' evacuations and apparent lack of use by authorities of 'local knowledge' (Molino Stewart, 2009).

The above 'unexpected' reactions to official flood interactions may be due to issues with the appropriateness and design of ECE activities, or it may relate to underlying human psychologies. This paper will now explore the latter factor with a view to linking both factors in the discussion below.

COMMUNITY DISASTER PSYCHOLOGY

It is not possible within the space confines of this paper to relate a large body of theory and research in disaster psychology to the responses described above. However, responses for one of the reactions – low preparedness levels – are explored below based on some of the psychological theory and research available.

Adopting 'Protective Behaviours'

Recent research regarding community preparedness for natural hazards has highlighted that the provision of information and increasing knowledge about the nature of such threats may, for many individuals, be insufficient to motivate specific preparedness activities (Lindell and Perry, 2000). Increasingly, social and psychological factors are being examined regarding the role they may play in hazard preparedness and how they may be proactively addressed as part of ECE activities. This section will examine threat perception, perceived coping and other psychological factors affecting decision-making associated with hazard preparedness,

and consider potential application with community flood preparedness.

In recent decades, a range of 'health protection' models have been developed to describe factors that may both motivate and inhibit protective behaviours relating to perceived threats in the environment. These include public health threats such as smoking and diet, through to preparedness and response activities for major disasters. One such model, 'Protection Motivation Theory' (PMT), has examined behavioural response factors across a range of such scenarios (Rogers, 1983, Floyd, 2000). This model highlights that the motivation to engage in protective behaviours reflects a balance between appraisals regarding the inherent threat of a given scenario (i.e. its probability, likely severity, and the specific vulnerability of the perceiver and their loved ones) and the personal capacity to manage such threats. Under this model, the perceived threat inherent to a specific hazard is mediated by the individual's perceived capacity to cope with such a situation ('coping self efficacy'), which also includes the resources they may be able to employ (financial, physical and social) to prevent or mitigate potential adverse affects. These latter factors mean that while motivation to engage in protective actions will be influenced by threat appraisals and coping appraisals, the latter have often been shown to be stronger predictors of such responses. In essence, individuals must believe that effective actions are available and that they are capable of implementing these, if adaptive response is to occur. Figure 1 presents a generic model of the specific appraisals that underpin the motivation for protective behaviours, as a precursor to behavioural response.

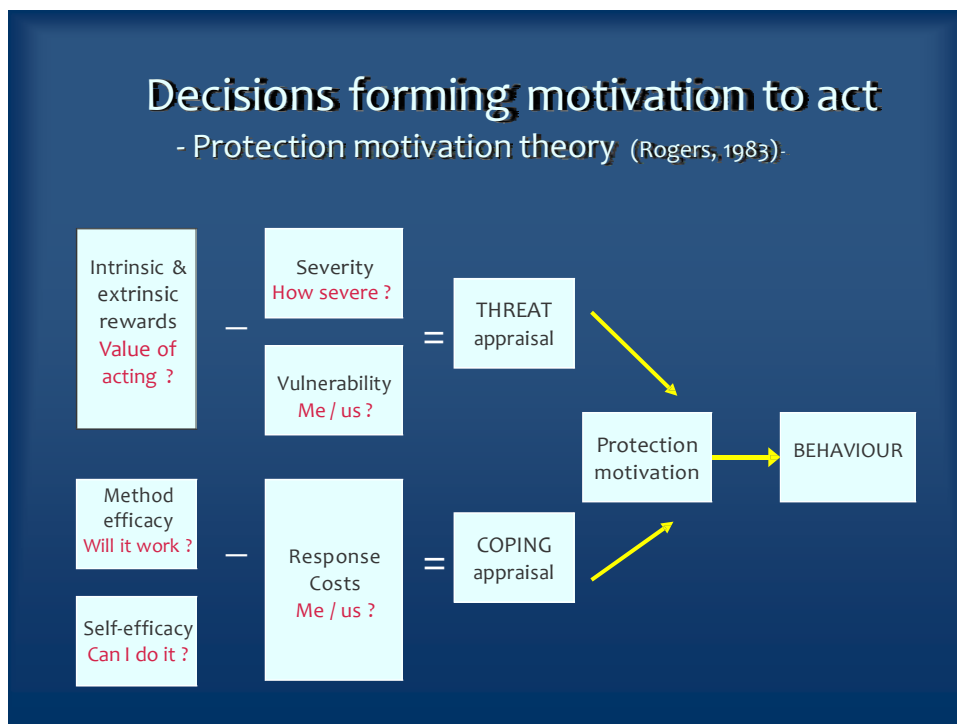


Figure 1 – Cognitive factors affecting motivation for protective behaviours

While protective behaviour models such as PMT have predictive utility across a range of health risk situations, a number of cognitive biases specific to natural hazards are also known to affect these risk judgements. 'Optimism bias' refers to the tendency of individuals to compare their situation with others and perceive their own situation to be more favourable. For example, research in Wellington, New Zealand found that people judged they were less likely suffer harm in an earthquake than people that they knew (Spittal et al 2005). Lindell et al (2000) suggest that people who face such risks often deny, or otherwise fail to personalise such risks, often transferring this to other people. A corollary of this is that while people may

understand the need for hazard preparedness, and understand risk messages, they may

regard this information as applying to others, but not themselves (Burger, 1992). A related phenomenon known as 'risk compensation' (also 'levee syndrome') relates to citizen's tendency to overestimate the capacity of hazard mitigation systems (e.g. controlled burns, levees) to eliminate a threat. Again, individuals may acknowledge the threat, but divest themselves of personal responsibility for its management, transferring this to organisations and systems. This can also relate to a process known as 'proximal cue' probability, whereby risk estimates are judged relative to the most recent hazard event, with distant examples deemed 'unlikely'. This latter tendency presents particular difficulties for flood preparedness where major events may be years, or even decades apart.

Hazard Preparedness - Decision Pathways

Some of the most detailed models pertaining to natural hazard preparedness have been developed to examine decision pathways relating to earthquake and bushfire preparedness. Paton et al (2003, 2006) have presented empirically-derived models of such preparedness that draw upon cognitive elements common to PMT models but which also incorporate perceived social norms, affective states and organisational trust. Similar to PMT, these models highlight the central importance of developing the motivation to prepare, and to form a specific implementation intention, as this precursor is strongly predictive of actual preparedness behaviours. Related hazard preparedness models, including the Theory of Planned Behaviour (Ajzen, 1991) and the Theory of Goal Achievement (Gollwitzer, 1999), also examine the central role of intent formation, but with variations as to the contributing factors. Importantly, the latter theory stresses that implementation intentions enhance the attainment of behavioural goals because they help people both store and retrieve their intentions from memory; that is, if people do not form implementation 'blueprints' or 'mental models', they tend to forget their goals.

Preparing and not preparing – 'customers' and 'visitors'?

The research of Paton and his colleagues has examined a range of natural hazard preparedness scenarios and developed empirically derived models relating to earthquakes (Paton et al 2003) and bushfires (2006) and considered their applicability in relation to flood preparedness. This research indicates that preparedness intent is comprised of two qualitatively distinct factors; 'intention to prepare' and 'intention to seek information'. Although 'intention to prepare' predicted the take-up of protective behaviours, 'intention to seek information' was not associated with such response (see Figure 2). As Paton described, the latter represented a response 'end point' that had no relationship to preparedness activities. Furthermore, the study data indicated that these respondents do not appear to represent an earlier 'stage' response, such that they may later progress towards more a more proactive stance. Rather, such individuals appear to construe their relationship with the hazard in such a way that it culminates with the decision of 'not preparing'. As highlighted in the PMT model, perceived person coping (i.e. poor coping 'self efficacy') appears to be central to this decision pathway and relates more broadly to outcome expectancies. The implications of this are that ECE practitioners may need to employ quite different approaches to identify and engage this latter group; particularly those that promote core competencies and control beliefs.

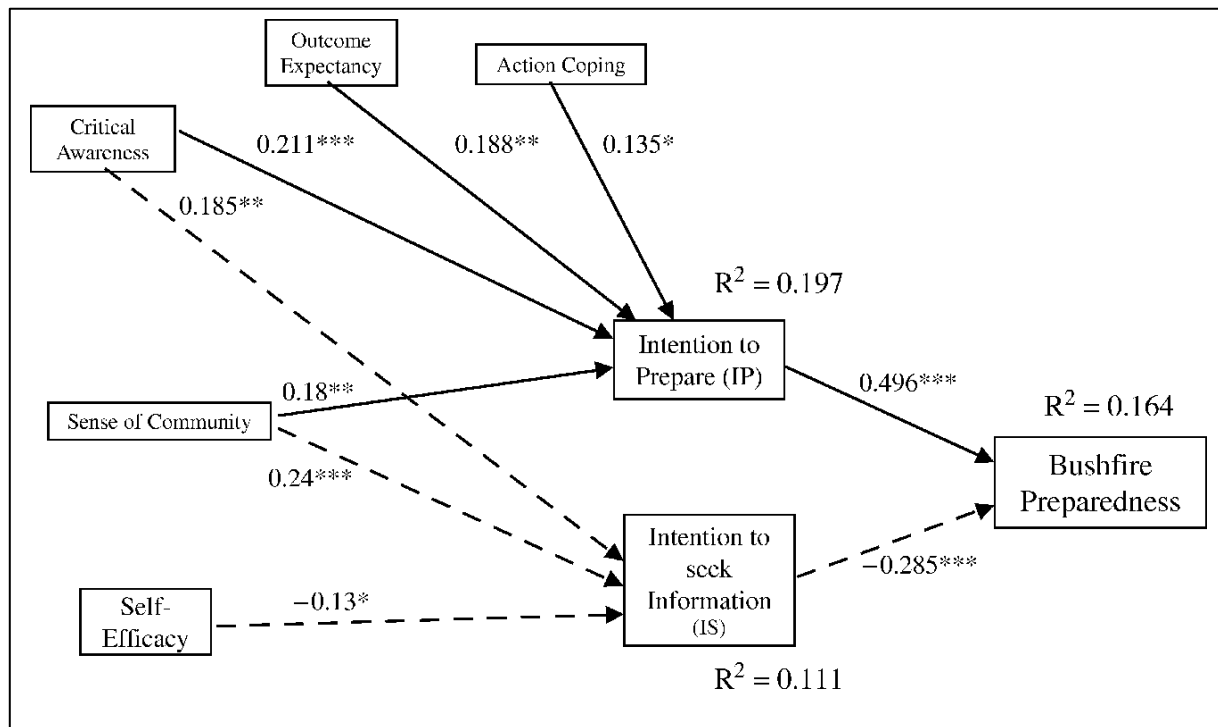


Figure 2 – Appraisal factors affecting intention formation and hazard preparedness (Paton et al, 2006)

These findings suggest that individuals in hazard preparedness contexts are likely to have different ways of relating to risk information and may require different ECE strategies. In this sense, it may be useful to conceive of distinct ‘customer’ and ‘visitor’ groups, with the latter potentially more ambivalent about mitigation and response planning. Paton makes the important point that hazard information is not ‘neutral’ but relative to the perceiver.

Broadly, ‘visitors’ are more likely to report low perceived self-efficacy regarding preparedness tasks, perceive associated outcomes to be more negative and more likely to process negative emotions (e.g. worry) through denial (‘seeking information’ perhaps being a socially acceptable description of the decision to not prepare). As such, strategies for this group may include; eliciting details of their threat ‘mental model’ and correcting basic misunderstandings, encouraging basic competencies and control beliefs (particularly through concrete examples and neighbour ‘community consultants’) and highlighting how specific actions can reduce damage or enhance safety.

‘Customer’ groups may have greater motivation, seek out specific information and resources and have specific implementation plans. However, the latter may be of poor quality at a level of detail and implementation may ‘drift’ if perceived hazard preparedness timeframes are long. Such factors may particularly undermine flood preparedness due to its response requirements and inter-event latency in some regions. Figure 3 presents details of ECE strategies derived from earthquake and bushfire preparedness research that may potentially inform ECE practice relating to flood preparedness, although further research is needed to help establish their utility in the latter context.

Hazard Preparedness – Engaging Disparate Groups

Intention formation – two qualitatively different groups

‘Intention to prepare’

- High action coping, problem solving
- Expect positive outcomes
- Predicts action – ‘customers’
- Amenable / seeking information
- Detail, timing of action

‘Intention to seek information’

- Perceive low coping ‘self-efficacy’
- Do not expect positive outcomes
- Predicts non-action (end point) – ‘visitors’
- Ambivalence, responsibility transfer, denial

Potential ECE strategies

- Establish their ‘position’ re preparedness intentions
- Determine ‘mental model’ of hazard/threat – correct misunderstandings
- Anxiety > Encourage control beliefs, core competencies
- Hazard / damage may be selective - how specific actions can reduce damage
- Small cost, big win (iterative process)
- Use cognitive dissonance (small initial response encourages view it’s ‘worthwhile’)
- Multi-purpose, immediate benefit (e.g. ‘all hazards’ kit)
- Address perceptual bias (e.g. risk compensation)

Increased trust, perceived competency/control > higher risk acceptance > greater intent formation

Figure 3 – Potential strategies for engaging disparate hazard preparedness groups.
(Mileti et al, 2004, Paton et al, 2006)

DISCUSSION

Implications for floodplain and emergency management

As discussed in the introduction, those involved in floodplain management and flood emergency management are generally becoming more involved in ECE activities. Considerable research (e.g. Elsworth et al, 2009) has been conducted into the nature and possible effective design of these activities based on program evaluations. However, there have been few attempts other than Dufty (2008) at linking ECE design with disaster psychological research, particularly in relation to flooding.

The above exploration of the psychological background of flood-affected people has significant implications for flood-related ECE activities. Flood ECE activities in the past have generally been based on the assumption that people will naturally convert risk awareness into preparedness behaviours such as preparing emergency plans. The thinking has been “we’ll provide people with information, and they’ll act appropriately before, during and after a flood”. As shown above and from other research (e.g. Rhodes, 2011), a direct causal relationship does not exist between risk awareness and preparedness, and there are other factors such as action coping, outcome expectancy, sense of community and self-efficacy that also determine preparedness. Therefore, those involved in flood ECE should consider this more complex relationship in designing community learning activities for preparedness.

Furthermore, psychological theory and research provides an insight into why people have different levels of risk awareness and thus interest in ECE activities e.g. consultations related to flood studies and floodplain risk management plans. For example, as discussed above in relation to the PMT model, individuals must believe that effective actions are available and that they are capable of implementing these, if adaptive response is to occur. A number of cognitive biases specific to natural hazards are also known to affect these risk judgements.

Another implication for floodplain and emergency managers is that there appears to be a least two groups of people in the community with differing disaster psychological profiles. Floodplain and emergency managers have generally treated 'the community' as one in the design of ECE activities. However, research shows that there are at least distinct 'customer' and 'visitor' groups, with the latter potentially more ambivalent about mitigation and response planning. These groups are likely to have different ways of relating to risk information and may require different ECE strategies as proposed in Figure 3.

The appeal of social media

The term 'social media' refers to Internet-based applications that enable people to communicate and share resources and information. Some examples of social media include blogs, discussion forums, chat rooms, wikis, YouTube Channels, LinkedIn, Facebook, and Twitter. Social media can be accessed by computer, smart and mobile phones, and mobile phone text messaging (SMS).

The extent of social media use in the response and recovery of communities impacted by the 2011 Queensland and Victorian floods has been well documented (e.g. Queensland Police Service, 2011, Alliance Strategic Research, 2011). Dufty (2011a) identifies six main ways in which social media can be used in emergency management:

1. Providing intelligence to emergency managers through 'crowdsourcing'
2. Engaging with people to help them prepare for events
3. Providing information (e.g. warnings) to communities during events
4. Providing support to people during and after a disaster
5. Coordinating response and recovery
6. Post-event learning.

It should be noted that several emergency agencies in Australia are using social media for some of these purposes. Social media can also be used by floodplain managers such as local councils in community consultations and education related to flood risk.

Social media have applications across all ECE activities (Dufty, 2011b). Furthermore, as Keim and Noji (2011) state, 'social media rely on peer-to-peer (P2P) networks that are collaborative, decentralised and community driven. They transform people from content consumers into content producers'. They therefore have the benefit of directly conveying people's psychological makeup as they are learner-centred, in comparison to many flood-related ECE activities that are only provider-centred. Further psychological and ECE research is required to effectively utilise the 'window' into the community that social media provide.

CONCLUSION

This paper could only explore some of the psychological theory and research that related to preparedness, one of the interactions five main interactions that floodplain managers and flood emergency managers have with flood-affected communities in NSW. The paper found that threat perception, perceived coping and other psychological factors have major implications for floodplain and emergency managers in the type and design of flood ECE activities. Social media appear to have great promise in providing an insight into the psychological characteristics of flood-affected communities. There is a need for further research to examine the application of psychological theory and research with flood-related ECE.

REFERENCES

- Ajzen, I. (1985). From intentions to actions: A theory of planned behavior. In J. Kuhl & J. Beckmann (Eds.), *Action control: From cognition to behavior*. Berlin, Heidelberg, New York: Springer-Verlag.
- Alliance Strategic Research (2011). *Social media in the 2011 Victorian floods*. Report for VICSES and the Office of the Emergency Services Commissioner.
- Burger, J. M., & Palmer, M. L. (1992). Changes in Generalization of Unrealistic Optimism Following Experiences With Stressful Events: Reactions to the 1989 California Earthquake. *Personality and Social Psychology Bulletin*, 18(1), 39-43.
- Dufty, N. (2008). *Building Community Resilience to Floods: The Role of Education*, Molino Stewart publication, Parramatta, NSW. (available on kindle)
- Dufty, N. (2011a). Using social media to build community disaster resilience. Presentation to a meeting of the Newcastle/Lake Macquarie Local Emergency Management Committee, 24 November 2011.
- Dufty, N. (2011b). Engagement or education? *The Australian Journal of Emergency Management*, 26(3), July 2011, 35-39.
- Elsworth, G., Gilbert, J., Robinson, P., Rowe, C., and Stevens, K. (2009). *National Review of Community Education, Awareness and Engagement Programs for Natural Hazards*, report by RMIT University commissioned by the National Community Safety Working Group of the Australian Emergency Management Committee.
- FitzGerald, Gerry, Du, Weiwei, Jamal, Aziz, Clark, Michele J., & Hou, Xiang-Yu (2010) Flood fatalities in contemporary Australia (1997-2008): disaster medicine. *Emergency Medicine Australasia*, 22(2), 180-186.
- Floyd, D. L., Prentice-Dunn, S. and Rogers, R. W. (2000). A Meta-Analysis of Research on Protection Motivation Theory. *Journal of Applied Social Psychology*, 30: 407-429.

Gissing, A., Molino, S., and Cameron-Smith, C. (2008). How do you improve community response to warnings? Paper presented to the 2008 FMA Conference.

Gollwitzer, P.M. (1999). Implementation intentions: strong effects of simple plans. *American Psychologist*, 54:493–503

Keim, M.E., & Noji, E. (2011). 'Emergent use of social media: a new age of opportunity for disaster resilience', *American Journal of Disaster Medicine*, 6(1), 47-54.

Lindell, M. K., & Perry, R. W. (2000). Household Adjustment to Earthquake Hazard: A Review of Research. *Environment and Behaviour*, 32(4), 461-501.

Micromex (2010). Draft Flood Education Advisory Committee Post Program Evaluation. A social research report prepared for Hunter-Central Rivers Catchment Management Authority.

Mileti, D., Nathe, S., Gori, P. & Lemersal, E. (2004). *Public Hazards Communication and Education: The State of the Art*. Boulder, CO: Institute of Behavioral Science, Natural Hazards Research and Applications Information Center, University of Colorado, 2004.

Molino Stewart (2009). Review of the May 2009 East Coast Low Warning and Public Information, report published on the NSW State Emergency Service website www.ses.nsw.gov.au.

NSW Department of Infrastructure, Planning and Natural Resources (2005). *Floodplain Development Manual: the management of flood liable land*. New South Wales Government.

NSW State Emergency Service (2011). *One SES; NSW SES Plan 2011-2015*. New South Wales Government.

Paton, D. (2003). Disaster Preparedness: a social cognitive perspective. *Disaster Prevention and Management*, 12(3), 210-216.

Paton., D., Kelly, G. Brugelt, P. & Doherty, M., (2006) Preparing for bushfires: understanding intentions. *Disaster Prevention & Management* 15(4), 566-574.

Paton, D. (2006b). Promoting household community preparedness for bushfires: A review of issues that inform the development and delivery of risk communication strategies: Bushfire Co-operative Research Centre.

Pfister, N. (2002). *Community Response to Flood Warnings: the Case of an Evacuation from Grafton*, NSW SES research paper.

Queensland Police Service (2011). *Disaster management and social media – a case study*. Media and Public Affairs Branch, Queensland Police Service

Rhodes, A. (2011). Opinion: Ready or not? Can community education increase householder preparedness for bushfire? *Australian Journal of Emergency Management*, 26(2), April 2011, 6-10.

Spittal, M. J., McClure, J. Siegert, R.J. and Walkey F. H. (2005). Optimistic bias in relation to preparedness for earthquakes. *Australasian Journal of Disaster and Trauma Studies* 2005 (1), 1-10.