

Establishing information seeking pathways in slow and flash floods

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ABSTRACT

The purpose of this paper is to investigate information seeking behaviour of people involved in slow and flash flood disasters, specifically how they received the first alert, where they then turned for more information, and what their main sources and forms were. An online and mailed survey based on models of problem-specific information seeking and risk information for natural hazards secured responses from Australians who had experienced flash flood ($n = 91$) and slow flood ($n = 41$). It found that information pathways taken by individuals are different for slow and flash floods, but the set of information forms and sources used are similar. 'Other people', television and news and weather websites were predominant sources and forms in flash flood, and online sources, television and radio predominant in slow flood. The importance of other people and mainstream media (including their online sites) in information behaviour means that mainstream media should remain an important component of information efforts by agencies. This study builds further evidence that disaster type and the media landscape should be taken into account when developing warning and response communication strategies, and allows public information officers to prioritise communication forms during response.

1. Background

The value of effective communication with the community during a disaster is well established as a central factor in successful disaster management. It has been attributed to saving lives and livelihoods [1–8], while communication done badly has contributed to failed response [9,10] and even to deaths [11]. In Australia between 2003 and 2016, reviews of incidents and exercises, including the 2009 Black Saturday bushfires, found that between 19% and 21% of all recommendations for improvement related to communication with the community [12,13]. While agency information delivery, particularly of warnings, has been well researched [14–18], receipt of this information by affected individuals and use of all information forms and sources during the response phase of disaster has been lightly studied. Exceptions include studies on tornado [19], earthquake [20,21], wildfire [22–24], hurricane [25], terrorist attacks [26], storm [27,28], flood [29], epidemic [30], crisis communication [31,32], flood [33] and using scenarios [34–36]. A large number of broader studies have added to the field by including one or two information source or form questions that contribute to this picture [for instance, 8,21,37–47]. Other studies have focused on one information form or cluster of forms (such as Twitter [48], social media generally [49], flood maps [50] or mass media [51]) or specific information such as health messages following a disaster impact [52].

How people find out about both slow and flash floods, their

confirmation behaviour, and the forms and sources of information they subsequently use has not been clearly illustrated. Human behaviour in flash floods, particularly, has not been well researched [53]. Knowledge of information-seeking is critical for agency public information officers to determine the most effective sources and forms for flood communication strategies. This study aims to document from the flood literature clear information seeking pathways for both types of flood from the point where people first become aware of the threat. It will contribute Australian research that builds on this picture of information seeking behaviour in slow and flash flood. In doing so, it will provide foundations for selection of sources and forms for agency flood communication in future. However, it will not consider the effect of information seeking on decision-making or evacuation, or the effect of message composition on behaviour.

2. The frameworks for this study

2.1. Foundation models

Understanding human behaviour and social systems during and after a disaster is stressed by Manoj and Hubenko-Baker [54] as critical in communication system design, and is therefore important to this study. The model of warning response presented by Mileti and colleagues [14,17,55–57] was one such attempt to understand human behaviour during disaster, and the protective action decision-making model

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(PADM) [58] was a second. The Mileti group's risk communication model for natural hazards attempted to generalise a task-oriented decision-making model based on information receipt, and the perceptions of individuals receiving the information. Lindell and Perry's PADM model, however, attempted to explain the decision-making that emerged as a consequence of information received during a disaster. It is the task-orientation of the Mileti group's model that makes it suitable for this study, as their risk information for natural hazards model was considered to have potential to explain behaviour that enabled decisions to be made, while the PADM model could be effectively used during the next step, which would be to explain decision-making arising from and resulting in, information behaviour in a disaster.

Mileti and O'Brien [14] described a behavioural process common when a disaster approaches or has occurred:

1. Receiving an alert;
2. Believing the alert is credible/confirming the threat;
3. Personalising the threat;
4. Determining whether protective action is needed;
5. Determining whether protective action is feasible; and
6. Deciding what action to take and taking action.

Firstly, a person receives a message about an imminent or occurring disaster from one or more environmental cues or from another person, a friend or acquaintance, or a someone via media. Secondly, people attempt to confirm, by a visual check, tuning in to mainstream media or talking to another person [14]. From this information, a meaning for what they have just heard or seen is processed, which then enables them determine the accuracy and salience of the information. Belief that the warning is serious is a significant obstacle to individuals taking action, particularly if the conditions are similar to other incidents in the past that had not developed into a disaster [59] or if the situation was outside their comprehension [60]. This is the third phase, personalisation of the process [14]. The fourth stage is deciding the disaster is relevant to them, what to do (fifth step) and to take that action (sixth). It is a looped process that can be repeated as new information is received that changes the personalisation perspective for the individual [14]. The sequence is not the same for everyone: some people may bypass one stage or more, and different people spend different amounts of time on each stage, as each stage can be affected by the characteristics of the individuals involved or the characteristics of the source or

form [61]. Mileti and colleagues attempted to illustrate this using the following diagram (Fig. 1).

Within this framework, Mileti, Sorensen, Fitzpatrick and O'Brien [14,17,57,61] proposed that once people have received notice of a disaster, they seek information to define the situation by confirming the contents of the message through another source, sometimes neighbours, friends, family or other media, including the internet [62–66].

The second model on which this study is based is problem-specific information-seeking proposed by Savolainen [67,68]. This model considered information pathways as a sequence of sources and was one of the first attempts to describe information-seeking for a specific problem [69]. Savolainen incorporated into this model 'source preference criteria' and 'information source horizons' that incorporate three zones of importance – most important sources, secondary sources and marginal sources [68]. Savolainen classified sources into three groups – human sources, networked sources and others. These features are shown in Fig. 2, along with a representation of the sequence of sources used. The process of information seeking in Savolainen's model included feedback loops that emphasised the most important sources and showed the information seeker consistently returning to the first source of information and to reconsider the problem at hand.

Savolainen confirmed in subsequent interview research [68,70] that the sequence of sources used will mostly progress through the zones, with a feedback loop sending the information-seeker back to already-used sources consistently through the process. The problem with Savolainen's classification of the importance of sources was that it made the source groups very general. With reference to the current study, information seeking in a flood, this puts at risk the usefulness of research as a decision-making tool for communicators. For instance, Savolainen's classification 'networked sources' could cover radio, television and internet, and it would not be evident to anyone but the researcher that the preference in a particular case might be radio. For this reason sources will not be grouped as Savolainen outlined.

Savolainen's model also addressed source preference criteria. These were factors that might affect a person's selection of sources such as their background, existing knowledge, the type of media involved and access to this media, and demographic features [68]. While this data was collected, effects of source preference criteria will not be explored here as the focus of the study is to establish a range of possible information patterns undertaken in slow and flash flood.

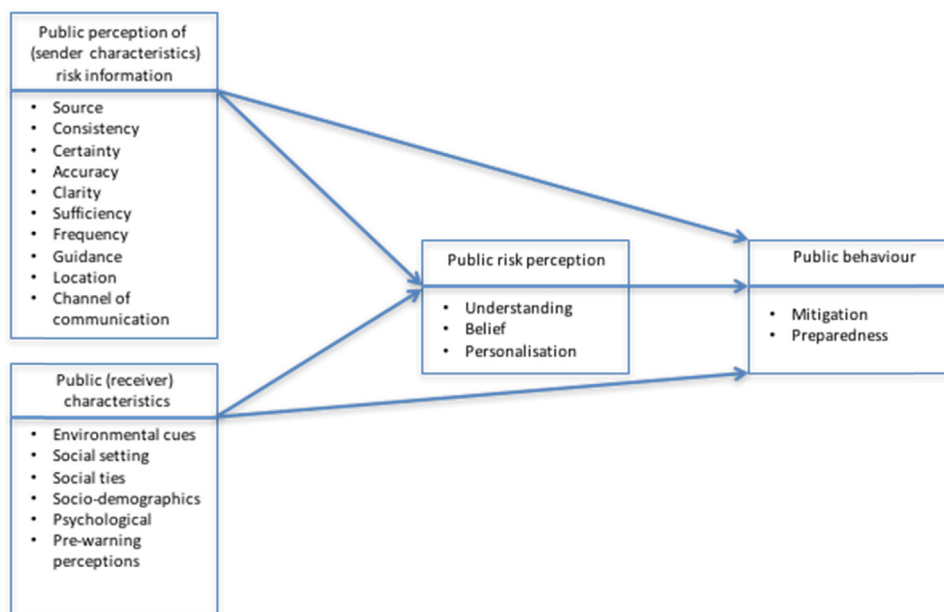


Fig. 1. A model for risk communication for natural hazards developed by Mileti, Sorensen and O'Brien [14,17].

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